Uncertainty of channel C Total background expectation 7 Total background error ±	CR_1^{DF} 7127.54	tZ 0.46	Wt 252.75 ± 55.25	Н 1.86	WW 14.04	ZZ 0.02	WZ 0.68	$\frac{t\bar{t}W + t\bar{t}Z + t\bar{t}WW}{21.47}$	DY 0.77	Z 37.61	$tar{t}$ 5544.34	Fakes 1253.55
tation	7127.54	0.46	252.75 ± 55.25	1.86	14.04	0.02	0.68	21.47	0.77	37.61	5544.34	1253.55
		0	± 55.25		00.00.				- -			0.0 201 1
	± 725.66	±0.46	í	± 0.27	± 29.20	± 0.10	± 1.53	± 4.84	± 0.79	土29.40	± 698.04	±120.02
	-											
ale 	± 554.43 ± 389.03	+0.00 + ±0.00	± 0.00 +17.86	± 0.00 ± 0.19	± 0.00 ± 0.82	±0.00 +0.00	00.0# +0.09	± 0.00 ± 0.71	±0.00 +0.00	± 0.00 +3.07	± 554.43 ± 366.25	00.00 +
	± 166.42	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 166.42	± 0.00
_Fakes_CR_obs_BDTG_bin_0	± 120.91	土0.00	土0.00	土0.00	± 0.00	± 0.00	± 0.00	±0.00	土0.00	十0.00	±0.00	± 120.91
	± 83.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 83.00	±0.00
CellOut energy scale	±78.76	±0.01	±2.51	±0.01	± 0.14	00.04 +	±0.06	± 0.05	±0.00	± 0.41	±75.57 ± го ег	00.04 1
Veor	±о1.49 ∔к∩кк	70.07	HED EE	70.07			50.0H	00.04 H	01.01 1	C0.71		0.04
	+44.43	+0.01	+2.47	+0.02	+0.26	+0.00	+0.00	+0.01	+0.00	+0.08	+41.58	+0.00
	± 44.33	± 0.01	土7.08	± 0.05	± 0.39	±0.00	± 0.02	±0.60	± 0.02	± 1.05	+0.00	± 35.10
WGenerator	± 29.16	±0.00	土0.00	土0.00	± 29.16	土0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	± 0.00
	± 27.99	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 27.99	± 0.00	± 0.00
	± 26.50	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 26.50	± 0.00
7R_obs_BDTG_bin_0	± 10.50	±0.00	± 10.50	±0.00	±0.00	±0.00	±0.00	10.00 10.00	±0.00	+0.00	±0.00	±0.00
solution	±8.28	±0.01	± 1.65	± 0.13	± 0.42	±0.01	±0.09	±0.19	±0.00	±3.12	± 10.00	±0.00
α_systΔAsec	±0.04	00.0 1 -	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	± 0.00	±0.04	±0.00	± 0.00
	Н0.41 44.79	B 0						H U.UU + 4 73	00.0H		0000 +	H0.00
Z <i>CR</i> obs BDTC bin 0	+4.54	800++	00.0+	00.0+	000+	00.0+	00.0+	2000 ++	000 +	+4.54	0000+	800
	+2.67	+0.00	+1.23	+0.04	+0.28	+0.00	+0.08	20.04	+0.00	+0.21	+3.65	00.0+
	± 1.51	±0.00	±0.00	土0.00	±0.00	±0.00	± 1.51	±0.00	±0.00	+0.00	±0.00	±0.00
$DY_CR_obs_BDTG_bin_0$	± 0.77	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.77	± 0.00	± 0.00	± 0.00
	± 0.70	± 0.00	± 0.00	± 0.00	± 0.70	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$mcstat_WW_CR_obs_BDTG_bin_0$	± 0.66	±0.00	±0.00	±0.00	± 0.66	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
	± 0.55	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.55	±0.00
	±0.40	± 0.40	00.0H	00.0∏	± 0.00	00.0H	00.0H	100.00	00.0H	00.0H	00.01 -	00.0 H
ה ופ-חוום	±0.41 +0.15	8.0 H +	00.0H	00.0H	00.0 H +	00.0H	H0.00 150	±0.41 +0.00	00.0 H +	00.0H	00.0H	00.0 H +
	+0.13	+0.00	+0.00	+0.13	+0.00	+0.00	+0.00	0.00+	+0.00	+0.00	+0.00	+0.00
	± 0.10	±0.00	± 0.00	土0.00	± 0.00	± 0.10	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
	± 0.05	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.05	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
	土0.04	土0.04	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	十0.00	土0.00	土0.00
$t_Z Z_C R_o bs_B D T G_{bin_0}$	± 0.01	±0.00	± 0.00	±0.00	± 0.00	± 0.01	±0.00	±0.00	± 0.00	±0.00	+0.00	±0.00
α syst Z X sec	±0.00	00.00 H H	±0.00	00.01 ₩	±0.00	00.04 +0	00.01 +0.00	±0.00	±0.00	±0.00	0000 + +	00.04 +
	0000+	00.0+	00.0+	+0.00	+0.00	0.00+	00.01	00.04	+0.00	00.0+	00.0+	00.01
obs_BDTG_bin_0	±0.00 ±0.00	±0.00	十0.00	十0.00	土0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
	土0.00	土0.00	± 0.00	土0.00	土0.00	± 0.00	± 0.00	土0.00	± 0.00	土0.00	± 0.00	± 0.00
	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ-snape_mcstat_W t_S K_obs_BD I G_Din_U	±0.00	00.0 ₩ +	00.01 +000	00.01 ₩	±0.00	00.0	00.0 1 1	00.01 10.00	00.0 1 1	00.01 1	00.00 + +	00.0 1 1
		8 0 H +			00.0 H +	00.0H	00.0H	00.04 H	00.0 H +	00.04	00.0H	00.00 H H
0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	00.0++	+0.00	+0.00	+0.00	+0.00
	±0.00	±0.00	±0.00	土0.00	± 0.00	±0.00	+0.00	±0.00	±0.00	+0.00	±0.00	±0.00
bs_BDTG_bin_0	土0.00	±0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
0	土0.00	±0.00	土0.00	±0.00	± 0.00	土0.00	±0.00	±0.00	±0.00	±0.00	±0.00	土0.00
	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ-shape-mostat-W W -V K-obs-BDTG-bin-U	00.01 ₩	0.0 1 1 1	00.04 +	00.04 1	00.00 +	00.0 1 1 0 0 0 0 1 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	00.04 +0.00	±0.00	10.00 1 ± 0.00	00.0 1 1 1 0 0	00.00 + +	00.04 1
	00.04	800	00.0+	00.04	00.0 +	00.0+	00.0+	00.04	0000 +	00.0+	00.0+	00.04
0_n	±0.00	+0.00 +	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00 ±	±0.00	±0.00	+0.00 +	+0.00 +
	-			-	-		-					

Table 1: Breakdown of the dominant systematic uncertainties on background estimates in CR_1^{DF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

	¢											
Uncertainty of channel	CR_1^{DF}	tZ	Wt	Н	MM	ZZ	ZM	$t\bar{t}W + t\bar{t}Z + t\bar{t}WW$	DY	Z	$t\bar{t}$	Fakes
Total background expectation	5543.24	0.46	252.73	1.86	14.12	0.02	0.68	21.47	0.37	37.59	3960.37	1253.58
Total background error	± 75.11	± 0.46	± 54.81	± 0.27	± 29.20	± 0.10	± 1.52	土4.80	± 0.67	± 29.21	± 165.51	± 125.24
$mu_{t}t\overline{t}DF$	± 538.33	土0.00	±0.00	土0.00	± 0.00	十0.00	土0.00	十0.00	土0.00	土0.00	± 538.33	十0.00
a_systutAsec	100.1951 1001 96	00.01 1	±1.7 70	±0.00	±0.00	00.01 +000	0.0 1 1 0	10.00 10.00	00.01 ₩	±0.00	1391.U5	00.04 H
\sim shane mostat $Fakes CR$ ohs RDTC hin 0	+120.16	800+		000 +0	+0.00	00.0+	000+		0000+		00.04	+120.00
α -tilsRFSR.	± 119.73	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	± 119.73	+0.00
$\alpha_{-t\bar{t}GenPlusPS}$	± 58.91	±0.00	土0.00	土0.00	土0.00	十0.00	十0.00	土0.00	±0.00	土0.00	± 58.91	±0.00
CellOut energy scale	± 56.88	± 0.01	± 2.49	± 0.01	土0.14	± 0.00	± 0.06	± 0.05	± 0.00	± 0.41	± 53.70	± 0.00
$\alpha_{\rm syst}Wt {\rm Xsec}$	± 50.15	± 0.00	± 50.15	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
Lumi	± 44.11	± 0.01	± 7.04	± 0.05	± 0.39	± 0.00	± 0.02	± 0.60	± 0.01	± 1.05	± 0.00	± 34.94
α -PileUp	± 41.80	± 0.02	± 0.79	± 0.02	± 0.17	± 0.00	± 0.07	± 0.03	± 0.09	± 2.81	± 38.08	± 0.00
α -JVF	± 32.29	± 0.01	± 2.44	± 0.02	± 0.26	± 0.00	± 0.00	± 0.01	± 0.00	± 0.08	± 29.46	± 0.00
αWW Generator	± 29.16	± 0.00	± 0.00	± 0.00	± 29.16	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
α -ZGenerator	± 27.80	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 27.80	± 0.00	± 0.00
γ -shape_mcstat_tt_CR_obs_BDTG_bin_0	± 18.82	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	十0.00	± 0.00	±0.00	± 18.82	±0.00
γ -shape-mcstat- $W t$ - CR -obs- $BDTG$ -bin-0	± 10.44	±0.00	± 10.44	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
a_systZ Asec	±5.60	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±5.60	±0.00	±0.00
Set energy resolution	Н0.38 Н7 97	10.0T	±0.04	±0.13	±0.42	T0.01	±0.09	10.19 10.00	00.01 ₩	±3.10	01.7 1	10.00 15 27
aretTahisYsoc	10.01 +7.60	8 0 H +			00.0H			14.60		00.0H	00.04	10.01 H
\sim share mostat Z <i>CB</i> obs BDTC hin 0	+4.52	0000+	00.0+	000 +0	+0.00	00.0+	000+	00.0++	0000+	+4.52	00.0+	00.0+
CellOut energy resolution	± 1.62	±0.00	± 1.22	± 0.04	± 0.28	±0.00	± 0.08	± 0.07	± 0.00	± 0.21	± 2.59	+0.00
$\alpha_W Z Generator$	± 1.50	±0.00	土0.00	土0.00	土0.00	土0.00	± 1.50	土0.00	±0.00	土0.00	± 0.00	±0.00
α -syst WW Sec	± 0.70	± 0.00	± 0.00	± 0.00	± 0.70	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- DY - CR -obs- $BDTG$ -bin- 0	± 0.67	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.67	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- WW - CR -obs-BDTG-bin-0	±0.66	±0.00	±0.00	±0.00	± 0.66	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00
a systt Z Asec	±0.45	± 0.45	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00
γ -shape_mostat_ttW + ttZ + ttW W_CK_obs_BD'IG_bin_U	土0.41 土015	0.04	±0.00	00.0 1 1 0 0 0	+ 0.00	00.01 +000	±0.00	土0.41 土0.00	00.01 1	00.01 ₩	10.00 1	00.01 1
γ share mostat H CR obs RDTC bin 0	+0.13	8.0		130.01				00.04				0.01+
2ZGenerator	+0.10	+0.00	+0.00	+0.00	+0.00	+0.10	+0.00	00.01+	+0.00	+0.00	+0.00	0.00+
α -syst $WZXsec$	± 0.05	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.05	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_ $tZ_CR_obs_BDTG_bin_0$	± 0.04	± 0.04	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_ZZ_CR_obs_BDTG_bin_0	± 0.01	±0.00	十0.00	±0.00	±0.00	± 0.01	±0.00	十0.00	± 0.00	±0.00	± 0.00	±0.00
a_systZZXsec	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	+0.00
7-Shape_IIICStat_(t_CDA_ODS_DU t_CDIILO		8 0 H H						00.04 H H				00.0H
γ -subpermission is the matrix of the matrix of the matrix γ shape most at $t\bar{t}W \perp t\bar{t}Z \perp t\bar{t}WW \ VR$ obs. BDTC him 0	00.04	8.0	00.0+		0000+	00.0+	0000+	00.0+	0000+	00.04		00.0+
	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	00.01+	+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat- WW - SR -obs-BDTG-bin-0	±0.00	±0.00	±0.00	土0.00	±0.00	+0.00	±0.00	± 0.00	±0.00	+0.00	±0.00	±0.00
γ -shape-mcstat- tZ - VR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $t\overline{t}$ - VR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- Wt -SR-obs-BDTG-bin-0	±0.00	±0.00	十0.00	±0.00	±0.00	±0.00	±0.00	十0.00	± 0.00	±0.00	± 0.00	±0.00
γ -shape-mcstat- $ZZ_VR_obs_BDTG_bin_0$	±0.00	±0.00	土0.00	±0.00	± 0.00	±0.00	± 0.00	土0.00	± 0.00	±0.00	± 0.00	± 0.00
γ -shape-mcstat-Z-SR-obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ_shape_mcstat_DY_VR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00
γ_snape_mcstat_W Z_SK_obs_BUTG_bm_0	±0.00	00.0∏	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	± 0.00	00.0 -
γ shape mostat $Eabee CR abs RDTC him 0$	00.01 +	800 H H						00.04				0.01
'		800	00.04		00.01+	00.0+	000	00.04+	0000	00.01		00.04
γ -shape-mestat- $DY_SR_{obs}BDTG_{bin-0}$	+0.00	± 0.00	+0.00	+0.00	± 0.00	+0.00	± 0.00	+0.00	± 0.00	+0.00	± 0.00	+0.00
γ -shape_mcstat_ $TZ_SR_obs_BDTG_bin_0$	+0.00	± 0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	± 0.00	± 0.00	±0.00	±0.00	+0.00
γ -shape-mcstat-ZZSR_obs_BDTG_bin_0	土0.00	土0.00	± 0.00	土0.00	土0.00	土0.00	土0.00	土0.00	±0.00	土0.00	± 0.00	±0.00
γ -shape-mcstat- $WW_VR_obs_BDTG_{bin_0}$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-H-VR_obs_BDTG_bin_0	土0.00	±0.00	± 0.00	±0.00	± 0.00	± 0.00	土0.00	±0.00	± 0.00	十0.00	± 0.00	十0.00
γ_shape_mcstat_Wt_VR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -snape-mcstat_ $rakes_V h$ -obs_DLLG_pin_0	±0.00	BU.UH	nn.u±	TU.UU	nn.n∓	n	nn.u⊥	± 0.00	nu⊥	n.u⊥	nn.n⊞	± 0.00

Table 2: Breakdown of the dominant systematic uncertainties on background estimates in CR_1^{DF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Uncertainty of channel CR_D^{PF} tZ Total background expectation Total background error $T133.62$ 0.46 Total background error $T33.62$ 0.46 Total background error $T133.62$ 0.46 Total background error $T133.62$ 0.46 $Tababenersta Frakes-CR_obbs_BDTG_bin_0 \pm 73.38.44 \pm 0.03 a_systWrsec \pm 78.38.44 \pm 0.03 a_systWrsec \pm 78.44.36 \pm 0.00 a_systWrsec \pm 78.44.36 \pm 0.00 a_stabe=mestat.Wr.CR.o$			$\begin{array}{c c} ZZ \\ 0.02 \\ \hline 0.02 \\ 10.02 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ 10.00 \\ $	$\begin{array}{c c} W & Z \\ \hline 0.67 \\ \hline 0.67 \\ \hline 1.49 \\ \hline 1.48 \\ \hline 1.$	$t\bar{t}W + t\bar{t}Z + t\bar{t}WW$ 21.52 21.52 ± 4.85 ± 0.00		$\begin{array}{c c} z \\ \hline 37.89 \\ \hline 37.89 \\ \hline 2000 \\ \pm 20.00 \\ \pm 1.06 \\ \pm$		$\begin{array}{c} Fakes \\ \hline 1262.67 \\ \pm 1262.67 \\ \pm 1262.67 \\ \pm 126.48 \\ \pm 0.00 \\ \pm 0.$
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			0.02 10.02 10.02 10.03 10.03 10.04 10.05 10.05 10.06 10.07 10.08 10.09 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00	$\begin{array}{c c} 0.67 \\ \pm 1.49 \\ \pm 0.00 \\ \pm 0.0$	$\begin{array}{c} 21.52\\ \pm 4.85\\ \pm 0.00\\ $	$\begin{array}{c c} 0.77 \\ \pm 0.79 \\ \pm 0.79 \\ \pm 0.00 \\ \pm 0.0$	$\begin{array}{c} 37.89\\ \pm 29.78\\ \pm 29.78\\ \pm 20.00\\ \pm 2.68\\ \pm 2.08\\ \pm 2.00\\ \pm 0.00\\ \pm 0.00\\ \pm 1.06\\ \pm 1.00\\ \pm 1.06\\ \pm 1.00\\ \pm 1.0$		$\begin{array}{c} 1262.67\\ \pm 1262.67\\ \pm 0.00\\ \pm 0$
$\begin{array}{c} \pm 725.39 \\ \pm 554.00 \\ \pm 554.00 \\ \pm 388.44 \\ \pm 138.86 \\ \pm 388.44 \\ \pm 58.87 \\ \pm 58.87 \\ \pm 56.75 \\ \pm 44.36 \\ \pm 56.75 \\ \pm 44.36 \\ \pm 56.75 \\ \pm 26.75 \\ \pm 26.77 \\ \pm 26.43 \\ \pm 10.54 \\ \pm 26.43 \\ \pm 26.43 \\ \pm 26.43 \\ \pm 26.43 \\ \pm 26.66 \\ \pm 20.56 \\ \pm 20.66 \\ \pm 2$			+0.10 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.00000 +0.0000 +0.0000 +00000000	+1.49 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.0000 +0.000 +0.000 +0.000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.00000 +0.0000 +0.0000 +0.000000 +0.0000 +0.0000000 +0.00000000	$\begin{array}{c} \pm 4.85 \\ \pm 0.00 \\ \pm 0.0$	$\begin{array}{c c} \pm 0.79 \\ \pm 0.70 \\ \pm 0.00 \\ \pm 0$	$\begin{array}{c} \pm 29.78 \\ \pm 0.00 \\ \pm 0.16 \\ \pm 0.00 \\ \pm 1.06 \\ \pm 0.00 \\ \pm 28.27 \\ \pm 0.00 \\ \pm 4.19 \end{array}$		$\begin{array}{c c} \pm 126.48 \\ \pm 126.48 \\ \pm 0.00 \\ \pm 0.00 \\ \pm 10.00 \\ \pm 10.00 \\ \pm 10.00 \\ \pm 10.00 \\ \pm 0.00 \\ \pm 0.$
$\begin{array}{c} \pm 554.00\\ \pm 554.00\\ \pm 388.444\\ \pm 388.444\\ \pm 72\\ \pm 72\\ \pm 828.28\\ \pm 44.62\\ \pm 44.62\\ \pm 44.62\\ \pm 44.62\\ \pm 44.62\\ \pm 44.62\\ \pm 44.65\\ \pm 44.65\\ \pm 44.65\\ \pm 44.65\\ \pm 44.65\\ \pm 44.73\\ \pm 10.55\\ \pm 4.73\\ \pm 4.73\\ \pm 4.73\\ \pm 10.55\\ \pm 0.15\\ \pm 0.15\\ \pm 0.00\\ \pm$			±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.0000 ±0.0000 ±0.000 ±0.000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.0000 ±0.00000 ±0.0000 ±0.0000 ±0.000000 ±0.0000 ±0.00000000	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	$\begin{array}{c} \pm 0.00\\ \pm 2.68\\ \pm 0.00\\ \pm 0.00\\ \pm 0.00\\ \pm 0.00\\ \pm 1.06\\ \pm 0.10\\ \pm 28.27\\ \pm 28.27\\ \pm 0.00\\ \pm 0.00\\ \pm 4.19\end{array}$		$\begin{array}{c} \pm 0.00 \\ \pm 0.00 \\ \pm 121.31 \\ \pm 121.31 \\ \pm 0.00 \\ \pm$
$ \begin{array}{c} 100 \\ \pm 388,4400 \\ \pm 388,4400 \\ \pm 388,44165 \\ \pm 56,87 \\ \pm 26,68 \\ \pm 26,81 \\ \pm $			2000 2000 2000 2000 2000 2000 2000 200	10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,00 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000 10,000	10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10	± 0.00 ± 0.000 ± 0.0000 ± 0.00000 ± 0.00000 ± 0.00000 ± 0.000000 $\pm 0.00000000000000000000000000000000000$	± 2.00 ± 0.00 ± 0.00 ± 2.68 ± 2.00 ± 1.06 ± 1.06 ± 2.35 ± 2.35 ± 2.35 ± 2.00 ± 1.06 ± 2.00 ± 2.00 \pm		$\begin{array}{c} \pm 0.00\\ \pm 10.00\\ \pm 10.0$
$ \begin{array}{c} 10 & \pm 168.72 \\ \pm 168.72 \\ \pm 56.87 \\ \pm 44.65 \\ \pm 266.87 \\ \pm 266.87 \\ \pm 266.87 \\ \pm 266.81 \\ \pm 266.81 \\ \pm 266.48 \\ \pm 266.68 \\ \pm 266.68 \\ \pm 266.68 \\ \pm 266.68 \\ \pm 266.66 \\ \pm 26$			10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10	++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++	± 0.00 $\pm 0.$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	± 0.00 ± 0.00 ± 0.00 ± 2.04 ± 1.06 ± 1.06 ± 0.14 ± 28.27 ± 0.00 ± 4.19		$\begin{array}{c} \pm 0.00\\ \pm 10.00\\ \pm 10.0$
$ \begin{array}{c} 10 & \pm 121.31 \\ \pm 121.31 & \pm 56.87 \\ \pm 56.87 & \pm 44.65 \\ \pm 44.65 & 87 \\ \pm 44.65 & 82 \\ \pm 28.27 & \pm 44.36 \\ \pm 28.26 & 48 \\ \pm 28.26 & 48 \\ \pm 10.54 & \pm 28.27 \\ \pm 26.64 & \pm 26.66 \\ \pm 26.77 & \pm 26.77 \\ \pm 26.77 & \pm 26.76 \\ \pm 26.77 & \pm 26.7$			±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00	±0.00 ±0.07 ±0.07 ±0.07 ±0.07 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.000 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.0000 ±0.0000 ±0.0000 ±0.00000000	± 0.00 ± 0.07 ± 0.07 ± 0.07 ± 0.08 ± 0.00 $\pm 0.$	± 0.00 ± 0.00 ± 0.000 ± 0.18 ± 0.000 ± 0.000	± 0.00 ± 0.00 ± 2.94 ± 2.94 ± 1.06 ± 0.01 ± 2.01 ± 0.10 ± 2.02 ± 0.00 ± 2.02 ± 0.00 ± 4.19		± 121.31 ± 0.00 ± 0.00
$\begin{array}{c} \pm 81.86 \\ \pm 86.82 \\ \pm 56.82 \\ \pm 56.75 \\ \pm 56.75 \\ \pm 44.36 \\ \pm 44.36 \\ \pm 26.75 \\ \pm 44.36 \\ \pm 26.16 \\ \pm 26.43 \\ \pm 26.68 \\ \pm 26.68 \\ \pm 26.68 \\ \pm 1.47 \\ \pm 5.43 \\ \pm 5.43 \\ \pm 5.43 \\ \pm 5.43 \\ \pm 10.54 \\ \pm 0.10 \\ \pm 0.10 \\ \pm 0.00 \\ \pm 0.01 \\ \pm 0.00 \\$			+0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00	± 0.00 ± 0.07 ± 0.07 ± 0.07 ± 0.00 ± 0.00 \pm	± 0.00 ± 0.07 ± 0.07 ± 0.00 ± 0.00 \pm	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\ \pm 0.10\\ \pm 0.00\\ \pm 0.00\\$	± 0.00 ± 2.94 ± 2.94 ± 1.06 ± 0.14 ± 0.14 ± 0.14 ± 28.27 ± 0.00 ± 4.19		$\begin{array}{c} \pm 40.00 \\ \pm 40.00 \\$
$\begin{array}{c} \pm 76.87\\ \pm 56.87\\ \pm 44.65\\ \pm 44.65\\ \pm 44.46\\ \pm 44.46\\ \pm 56.87\\ \pm 26.87\\ \pm 26.87\\ \pm 26.81\\ \pm 26.81\\ \pm 56.81\\ \pm 26.68\\ \pm 41.73\\ \pm 4.73\\ \pm 4.73\\ \pm 5.81\\ \pm 5.81\\ \pm 5.81\\ \pm 10.56\\ \pm 0.10\\ \pm 0.01\\ \pm 0.01\\ \pm 0.00\\ $			±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00	± 0.07 ± 0.07 ± 0.00 ± 0.00 \pm	±0.07 ±0.07 ±0.08 ±0.08 ±0.08 ±0.08 ±0.09 ±0.09 ±0.09 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.00	± 0.00 ± 0.00 ± 0.002 ± 0.002 ± 0.000 ± 0.000 ± 0.000 ± 0.000 ± 0.000 ± 0.000 ± 0.000 ± 0.000	± 0.25 ± 2.94 ± 1.06 ± 1.06 ± 0.00 ± 28.27 ± 0.00 ± 4.19		$\begin{array}{c} \pm \pm 0.00\\ \pm 0.00\\ \pm \pm 0.00\\ \pm 0.00\\ \pm \pm 0.00\\ \pm 0.00\\$
$\begin{array}{c} \pm 50.75 \\ \pm 50.75 \\ \pm 44.62 \\ \pm 44.62 \\ \pm 244.65 \\ \pm 29.16 \\ \pm 28.27 \\ \pm 26.81 \\ \pm 5.81 \\ \pm 5.68 \\ \pm 10.55 \\ \pm 0.01 \\ \pm 0.01 \\ \pm 0.01 \\ \pm 0.00 \\ \pm 0.$			+ 0.00 + $+$ 0.00 + 0.000 + 0.000 + 0.000 + 0.000 + 0	± 0.00 ± 0.00 \pm	エ 10.04 10.05 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.0	± 0.02 ± 0.02 ± 0.00 ± 0.00	± 2.34 ± 0.00 ± 1.06 ± 0.14 ± 28.27 ± 0.00 ± 1.00 ± 1.00		$\begin{array}{c} \pm 0.00\\ \pm 0.00\\ \pm 10.00\\ \pm 10.00$
$\begin{array}{c} \pm 44.62 \\ \pm 44.62 \\ \pm 44.62 \\ \pm 28.27 \\ \pm 28.27 \\ \pm 28.27 \\ \pm 28.26 \\ \pm 28.26 \\ \pm 28.26 \\ \pm 28.26 \\ \pm 20.54 \\ \pm 26.68 \\ \pm 25.68 \\$			+ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$	± 0.00	エ 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.0	± 0.00 ± 0.00	± 0.00 ± 1.06 ± 0.14 ± 0.00 ± 0.00 ± 1.00 ± 1.19		##30.00 ##0.00 ##0.00 ##0.00 #0.00 #0.00 #0.00 #0.00 #0.00 #0.00 #0.00 #0.00
$\begin{array}{c} \pm 44.36\\ \pm 29.16\\ \pm 29.16\\ \pm 28.27\\ \pm 26.48\\ \pm 10.54\\ \pm 5.81\\ \pm 5.81\\ \pm 5.81\\ \pm 5.81\\ \pm 5.43\\ \pm 5.43\\ \pm 5.43\\ \pm 5.43\\ \pm 5.43\\ \pm 5.47\\ \pm 5.47\\ \pm 0.05\\ \pm 0.13\\ \pm 0.10\\ \pm 0.01\\ \pm 0.01\\ \pm 0.01\\ \pm 0.00\\ \pm$			1000000000000000000000000000000000000	± 0.00	$\begin{array}{c} 1 \\ 1 \\ 1 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\$	± 0.00 ± 0.00 \pm	± 0.14 ± 0.00 ± 28.27 ± 0.00 ± 4.19		± 1000
$\begin{array}{c} \pm 29.16\\ \pm 28.48\\ \pm 28.48\\ \pm 26.48\\ \pm 5.81\\ \pm 5$			$\begin{array}{c} + & + & - & 0 \\ + & + & + & 0 \\ + & + & 0 \\ - & 0 \\ + & + & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\ - & 0 \\$	± 0.00	1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000	± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00	± 0.00 ± 28.27 ± 0.00 ± 4.19	± 2.000 ± 2.81 ± 0.000	本 1 1 1 1 1 1 1 1 1 1 1 1 1
$\begin{array}{c} \pm 28.27\\ \pm 28.27\\ \pm 26.48\\ \pm 5.61\\ \pm 5.68\\ \pm 5.68\\ \pm 5.43\\ \pm 5.68\\ \pm 5.43\\ \pm 5.68\\ \pm 5.68\\ \pm 5.68\\ \pm 5.68\\ \pm 5.68\\ \pm 1.48\\ \pm 1.$			± 0.00	± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00	± 0.00 $\pm 0.$	1 1 1 1 1 1 1 1 1 1 1 1 1 1	± 28.27 ± 0.00 ± 1.19	± 23 ± 26 ± 26 ± 26 ± 26 ± 26 ± 26 ± 26 ± 20 ± 20 ± 0.00 ± 20 ± 0.00 ± 20 ± 0.00 ± 20 ± 0.00 ± 20 ± 0.00 $\pm $	本 1 1 1 1 1 1 1 1 1 1 1 1 1
$\begin{array}{c} \pm 26.48 \\ \pm 26.48 \\ \pm 5.681 \\ \pm 5.681 \\ \pm 5.681 \\ \pm 5.681 \\ \pm 5.43 \\ \pm 1.48 \\$			± 0.00	± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 1.48 ± 0.00 ± 0.00 ± 0.00	± 0.00 ± 0.10 ± 0.00 ± 0.00 ± 10.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00	+ 0.00 + 0.00	± 0.00 ± 0.00 ± 4.19	± 26.48 ± 0.00 ± 0.00 ± 0.000 ± 0.000 ± 0.000 ± 2.81 ± 0.000 ± 2.81	++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++
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$\begin{array}{c} \pm 5.68 \\ \pm 5.68 \\ \pm 4.55 \\ \pm 4.55 \\ \pm 4.55 \\ \pm 4.55 \\ \pm 4.57 \\ \pm 1.48 \\ \pm 1.4$			0.00000000000000000000000000000000000	± 0.00 ± 0.00 ± 0.00 ± 1.48 ± 0.08 ± 0.00	±0.00 ±4.73 ±0.00 ±0.00 ±0.00 ±0.00	十二 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 1		± 0.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00 ± 0.00	$\pm 1000000000000000000000000000000000000$
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$\begin{array}{c} \pm 4.55\\ \pm 1.37\\ \pm 1.37\\ \pm 0.77\\ \pm 0.77\\ \pm 0.77\\ \pm 0.77\\ \pm 0.66\\ \pm 0.66\\ \pm 0.65\\ \pm 0.66\\ \pm 0.46\\ \pm 0.66\\ \pm 0.13\\ \pm 0.10\\ \pm 0.01\\ \pm 0.01\\ \pm 0.00\\ \pm 0.00\\$	$\pm 0.00 \pm 0.00$		年 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 100000 10000 10000 10000 10000 10000 10000 10000 10000 1000	± 0.00 ± 1.48 ± 0.08 ± 0.00	1000 1000 1000 1000 1000 1000 1000 100	±0.00 ±±0.00	±0.00	± 0.00 ± 2.81 ± 0.00 ± 0.00	$0.000 \pm 0.00000000000000000000000000000$
$ \begin{array}{c} \pm 1.37 \\ \pm 1.37 \\ \pm 0.77 \\ \pm 0.77 \\ \pm 0.70 \\ \pm 0.66 \\ \pm 0.70 \\ \pm 0.01 \\ \pm 0.01 \\ \pm 0.00 \\ \pm 0.$			0.00 00.00 00.00 00.00 00 00 00 00	± 1.48 ± 0.08 ± 0.00	10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.000 10.000 10.000 10.000 100 1	±0.00 ±0.00	± 4.55	± 0.00 ± 2.81 ± 0.00 ± 0.00	0.00 0.00 0.00 0.00 0.00 0.00 0.00
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bs_BDTG_bin_0 = ±0.70 ±0.66 ±0.466 ±0.415 ±0.415 ±0.415 ±0.415 ±0.416 ±0.416 ±0.416 ±0.416 ±0.015 ±0.010 ±0.000 ±0.000	±1.54 ±0.04	4 ±0.28	00.0H	DO OL	00.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.000	10 11	±0.34	±0.00 ±0.00	10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 1000000
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20.55 20.46 20.46 20.46 20.41 20.15 20.10 20.04 20.01 20.00 20.00 20.00 20.00 20.00			±0.00	±0.00	- U.UU	+0.00	+0.00	+0.00	± 0.00
bs_BDTG_bin_0 ±0.46 ±0.41 ±0.13 ±0.13 ±0.10 ±0.05 ±0.01 ±0.00 ±0.00 ±0.00			± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.55	
bs_BDTG_bin_0 = 10.41 = 0.15 = 0.13 = 0.15 = 0.05 = 0.01 = 0.01 = 0.00 = 20.00 = 20.00 = 20.00			± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
±0.15 ±0.13 ±0.13 ±0.05 ±0.01 ±0.01 ±0.01 ±0.00 ±0.00			± 0.00	± 0.00	± 0.41	± 0.00	± 0.00	± 0.00	± 0.00
$\begin{array}{c} \pm 0.13 \\ \pm 0.10 \\ \pm 0.04 \\ \pm 0.04 \\ \pm 0.01 \\ \pm 0.01 \\ \pm 0.00 \\ \pm 0.0$		0 ± 0.00	± 0.00	± 0.15	±0.00	± 0.00	土0.00	± 0.00	土0.00
$tZ.CR_obs_BDTG_bin_0$ $ZZ.CR_obs_BDTG_bin_0$ $ZZ.CR_obs_BDTG_bin_0$ $tf_SR_obs_BDTG_bin_0$ $tf_SR_obs_BDTG_bin_0$ ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00			±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00
$ {}^{LZCR,obs_BDTG_bin_0} $	±0.00 ±0.00		01.01	±0.00	00.01 1	00.00 + +	00.0∏	10.00 1	00.0 1 1
$t_z Z_z C_R$ obs_BDTG_bin_0 ± 0.01 $t_z f_z S_R$ obs_BDTG_bin_0 ± 0.00 $t_z f_z S_R$ obs_BDTG_bin_0 ± 0.00 $t_z S_R$ obs_BDTG_bin_0 ± 0.00			00.0+		00.0+	000 +	00.0+		00.04
$\begin{array}{c} \pm 0.00 \\ \pm 1 E_S R_o bs. BDTG_bin_0 \\ \pm 1 - S R_o bs. BDTG_bin_0 \\ \pm 1 - 2 R_o bs. BDTG_bin_0 \\ \pm 1 - 0 0 \\ \pm 1 - 0 \end{array}$			+0.01	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
t.tf.SR_obs.BDTG_bin_0 ±0.00 t.H_SR_obs.BDTG_bin_0 ±0.00 t.H_SR_obs.BDTG_bin_0 ±0.00		0 + 0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
00.04 00.04 00.04			土0.00	土0.00	±0.00	±0.00	土0.00	± 0.00	土0.00
			± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00
			± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-WW-SR-obs-BDTG-bin-0 ± 0.00 ± 0.00		0 ±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00
	±0.00 ±0.00		±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	00.0 1 1 1 0 0 0 0 0 0 0
	+0.00 +0.00			00.0H	00.0H	10000 1000 1000 1000	00.0H		00.0H
00.04			00.0+	+0.00	800++	000+	+0.00	00.0+	800
0.00+			+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
<u>+0.00</u>			± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00
-0 ±0.00			± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
土0.00			± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$-BDTG-bin-0 \pm 0.00$			土0.00	±0.00	土0.00	± 0.00	±0.00	± 0.00	± 0.00
in_0		0 ±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00
±0.00			±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ_shape_mestat_DY_SK_obs_BDTC_bin_U ±0.00 2. chano mostot 4.7 CD che BDTC him 0 ±0.00	±0.00 ±0.00	0 + 10 00 0	00.0 1 1 0 0 0 0 1	00.0 1 1 1 0 0	10.00 1	00.00 + +	10.00 1 ±0.00	10.00 1	00.0 1 1 0
						10000 1000 1000 1000			00.0H
0000+			00.0+	0000+	00.0+	00.0+	+0.00	+0.00	0.01
0.01+			+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
			土0.00	土0.00	±0.00	±0.00	土0.00	± 0.00	土0.00
γ -shape-mcstat_Fakes_VR_obs_BDTG_bin_0 $\pm 0.00 \pm 0.00$	±0.00 ±0.00	0 ± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00

Table 3: Breakdown of the dominant systematic uncertainties on background estimates in CR_2^{DF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

$ \begin{array}{cccccccccccccccccccccccccccccccccccc$											
ackground expectation555.87 0.46 23.71 1.86 ackground error ± 75.28 ± 0.46 ± 55.03 ± 0.27 F ± 75.28 ± 0.46 ± 55.03 ± 0.000 FN ± 75.23 ± 0.000 ± 0.000 ± 0.000 FN ± 53.33 ± 0.000 ± 0.000 ± 0.000 FN ± 53.33 ± 0.000 ± 0.000 ± 0.000 FN ± 53.34 ± 0.000 ± 0.000 ± 0.000 FN ± 53.34 ± 0.000 ± 0.000 ± 0.000 FN ± 53.34 ± 0.000 ± 0.000 ± 0.000 FN ± 53.34 ± 0.000 ± 0.000 ± 0.000 FN ± 53.34 ± 0.000 ± 0.000 ± 0.000 FN ± 53.34 ± 0.000 ± 0.000 ± 0.000 FN ± 53.34 ± 0.000 ± 0.000 ± 0.000 FN ± 53.34 ± 0.000 ± 0.000 ± 0.000 FN ± 1.37 ± 0.000 ± 0.000 ± 0.000 FN ± 1.38 ± 1.38 ± 0.000 ± 0.000 FN ± 1.38 ± 1.38 ± 0.000 ± 0.000 FN ± 1.38 ± 1.38 ± 0.000 ± 0.000 FN ± 1.38 ± 0.000 ± 0.000 ± 0.000 FN ± 1.38 ± 0.000 ± 0.000 ± 0.000 FN ± 1.38 ± 0.000 ± 0.000 ± 0.000 FN ± 1.38 ± 0.000 ± 0.000 ± 0.000 <td< th=""><th>CR_2^{DF} tZ</th><th>Wt</th><th>Н</th><th>MM</th><th>22</th><th>ZM</th><th>$t\bar{t}W + t\bar{t}Z + t\bar{t}WW$</th><th>DY</th><th>N</th><th>$t\overline{t}$</th><th>Fakes</th></td<>	CR_2^{DF} tZ	Wt	Н	MM	22	ZM	$t\bar{t}W + t\bar{t}Z + t\bar{t}WW$	DY	N	$t\overline{t}$	Fakes
ackground error ± 73.28 ± 0.46 ± 55.03 ± 0.27 F ± 53.741 ± 0.00 ± 0.00 ± 0.00 ± 0.00 FY seal ± 337.31 ± 0.00 ± 0.00 ± 0.00 ± 0.00 FY seal ± 33.31 ± 0.00 ± 0.00 ± 0.00 ± 0.00 FY seal ± 33.31 ± 0.00 ± 0.00 ± 0.00 ± 0.00 FY seal ± 33.31 ± 0.00 ± 0.00 ± 0.00 ± 0.00 FY seal ± 1.141 ± 0.00 ± 0.00 ± 0.00 ± 0.00 FY seal ± 1.141 ± 0.00 ± 0.00 ± 0.00 ± 0.00 FY seal ± 1.147 ± 0.00 ± 0.00 ± 0.00 ± 0.00 FY seal ± 1.147 ± 0.00 ± 0.00 ± 0.00 ± 0.00 FY seal ± 1.147 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 FY seal ± 1.147 ± 0.00 ± 0.00			1.86	14.11	0.02	0.67	21.52	0.37	37.86	3966.55	1262.74
$ \begin{array}{c} F \\ F $		± 55.03		± 29.27	土0.10	土1.49	± 4.82	土0.67	± 29.59	± 166.09	± 125.71
$ \begin{array}{c} F \\ F $											
$ \begin{array}{c} \label{eq:constraint} Fakes CR.obs.BDTG.bin.0 \\ \text{B'SR} \\ \text{arease} Fakes CR.obs.BDTG.bin.0 \\ \text{arease} Fakes Fakes CR.obs.BDTG.bin.0 \\ \text{arease} Fakes Fa$		±0.00		±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 537.41	±0.00
$ \begin{array}{c} \label{constraint} Fakes. CR. obs. BDTG. bin.0 & for 0 & for 0$		+17.82		+0.81	+0.00	+0.09	+0.74	+0.00	+2.65	+258.99	+0.00
$\label{eq:scale} Junctar Lakes CR.obs.BDTG.bin.0 \\ Thirds cale the scale of the s$	± 122.23	± 0.00		± 0.00	土0.00	±0.00	± 0.00	± 0.00	± 0.00	± 122.23	± 0.00
Thus PS the set of the se	± 120.56	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 120.56
$ \begin{array}{c} \mbox{tensor} x = 0.01 \\ \mbox{tr} X = 0.01$		± 0.00		± 0.00	土0.00	土0.00	±0.00	± 0.00	± 0.00	± 58.24	± 0.00
$ \begin{array}{llllllllllllllllllllllllllllllllllll$		± 2.67		± 0.12	±0.00	±0.07	±0.07	±0.00	± 0.25	± 53.52	±0.00
$ \begin{array}{c} \label{eq:point} p \\ \mbox{fighted} p \\ \mb$		± 50.33	±0.00	±0.00	±0.00	0.00 ₩	±0.00	±0.00	±0.00	±0.00	±0.00
$ \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \end{array} \\ \begin{array}{c} \end{array} \\ \end{array} $		10.7 1 1 1 1 1 1 1 1	00.0∓	±0.39	±0.00	70.07	10.00	10.01 + 0.02	00.1H	±0.00	±35.19
$ \begin{array}{c} \mbox{Generator} \\ \mbox{Generator} \\ \mbox{arestat} \mbox{K} \mbox{CR.obs.BDTG.bin.0} \\ \mbox{arestat} \mbox{K} \mbox{arestat} \$		H0.07		01.01 +0.26		20.0H	±0.04	0000 H +	H2.97	10.10H + 00.35	00.0H
$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$		70.00 +0.00		± 0.20 ± 29.23	00.01 +0.00	00.0+	10.01 +0.00	+0.00	+0.00	+0.00	0.01+
$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$		+0.00		± 0.00	± 0.00	± 0.00	+0.00	± 0.00	± 28.08	± 0.00	+0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		± 0.00		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 18.85	± 0.00
$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$		± 10.48		± 0.00	土0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$		±0.00		± 0.00	±0.00	±0.00	±0.00	± 0.00	± 5.64	± 0.00	± 0.00
$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$		±0.00		±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	+0.00	± 5.39
$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$		10.00 1		00.01 ₩	00.01 ₩	00.04	114.70 10.00	00.0 +	10.00 14.53	00.00 + ±	00.0 H H
$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$		+1080	H0.13	±0.00		10.00	±0.00 +0.16	00.0H	Н4-07 4 16	10.00 +6.60	00.04
$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$		+0.00		+0.00	+0.00	+1.47	+0.00	+0.00	+0.00	+0.00	+0.00
		±0.00		土0.70	土0.00	±0.00	±0.00	±0.00	十0.00	±0.00	±0.00
$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$		± 0.00		± 0.00	± 0.00	± 0.00	± 0.00	± 0.67	± 0.00	± 0.00	± 0.00
		±0.00	±0.00	± 0.66	±0.00	±0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
		± 1.53	± 0.04	± 0.28	±0.00	±0.08	± 0.04	±0.00	± 0.34	± 2.00	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		10.00		00.01 1	00.01	00.01	10.00	00.0H		0000 H H	00.0H
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	-16-DILO ±0.41 +0.15	+0.00	+0.00	+0.00	+0.00	± 0.00 ± 0.15	±0.41 +0.00	+0.00	+0.00	+0.00	0.00 +0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		±0.00	± 0.13	±0.00	土0.00	±0.00	±0.00	±0.00	土0.00	±0.00	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		± 0.00		± 0.00	± 0.10	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		土0.00		土0.00	土0.00	± 0.05	± 0.00	± 0.00	± 0.00	±0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		±0.00		± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		10.00 +		00.00 + + 0.00	±0.01	00.04	10.00	00.01 +	00.0 1 1 1 0 0	10.00 1	00.00 # #
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		+0.00		+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
		±0.00		±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$DTG_{bin_0} \pm 0.00$	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
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$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		±0.00		±0.00	±0.00	00.01 1	±0.00	00.01 +	00.01 +0	00.00 +0.00	00.00 + +
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		00.01		+0.00	00.01 +0.00	00.01	-00.00 +0.00	0.00	00.01	00.00 +	0.04
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	+0.00 +
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		±0.00	±0.00	± 0.00	±0.00	±0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	±0.000 ±0.000	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$DTG_{bin-0} \pm 0.00$	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	+0.00	±0.00	+0.00	±0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		00.0 +	00.0#	00.01 + 0.00	00.04	00.0 +	00.01+	00.0 +	00.0#	001 +	00.0 H H
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		+0.00	±0.00	±0.00	±0.00	±0.00	±0.00	+0.00	±0.00	+0.00	+0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		± 0.00	± 0.00	± 0.00	±0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
± 0.00 {\pm 0.00 ± 0.00 ± 0.00 {\pm 0.00 \pm		± 0.00	土0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
±0.00 ±0.00 ±0.00 ±0.00		±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	+0.00	±0.00	±0.00	±0.00
	00.0#	±0.00 +0	00.01 +0.00	±0.00 +0.00	00.0 +	00.0 +0.00	00.0±+	00.0 +	00.0 +0.00	0.00 +	00.0 +
		1					I	+	ł	1	

Table 4: Breakdown of the dominant systematic uncertainties on background estimates in CR_2^{DF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$				77						C		5
1796.17 0.66 55.05 1.86 1.46 0.70 0.72 0.72 +772.23 10.4 55.53 -0.21 21.93 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03 -1.03<	T196.17 0.46 255.05 1.86 ± 732.23 ± 0.46 ± 55.37 ± 0.27 ± 732.23 ± 0.46 ± 55.37 ± 0.20 ± 394.83 ± 0.03 ± 16.90 ± 0.00 ± 394.83 ± 0.00 ± 0.00 ± 0.00 ± 55.17 ± 0.00 $\pm 1.12.15$ ± 0.00 ± 55.17 ± 0.00 $\pm 1.12.15$ ± 0.00 ± 55.17 ± 0.00 $\pm 1.12.15$ ± 0.00 ± 57.17 ± 0.00 ± 0.00 ± 0.00 ± 57.00 ± 0.00 ± 0.00 ± 0.00 ± 44.86 ± 0.00 ± 0.00 ± 0.00 ± 112.15 ± 0.00 ± 0.00 ± 0.00 ± 125.47 ± 0.00 ± 0.00 ± 0.00 ± 110.59 ± 0.00 ± 0.00 ± 0.00 ± 110.53 ± 0.00 ± 0.00 ± 0.00 ± 125.37 ± 0.00 ± 0.00 ± 0.00 ± 10.55 \pm		tZ	Wt	ц	MМ				DY	Ņ	tt	Fakes
1772.33 10.4 15.6.7 1.2.7 28.9.3 10.10 1.1.5 24.9.4 24.7.1 1757.31 10.0 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 <	± 732.23 ± 0.46 ± 55.37 ± 0.20	7196.17				14.03	0.03	0.79	21.95	0.77	40.22	5580.19	1280.82
1558.02 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000	$BDTG_bin_0 = \frac{1558.02}{100} \pm \frac{1}{20.00} \pm \frac{1}{20.00}$							± 1.58	± 4.95	± 0.79	± 32.01	土704.67	± 127.39
BDTG.hb. 100 100 100 100 100 100 100 100 100 10								0	0	0	-		0
	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$							00.0# +0.09	±0.00 +0.77	00.00 + 0.00	±0.00 +3.17	± 558.02 ± 372.88	00.00 +0.00
H311 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 100 <td>$\begin{array}{cccccccccccccccccccccccccccccccccccc$</td> <td>$\pm 166.04$</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>±0.00</td> <td>±0.00</td> <td>± 0.00</td> <td>± 0.00</td> <td>± 166.04</td> <td>±0.00</td>	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	± 166.04						±0.00	±0.00	± 0.00	± 0.00	± 166.04	±0.00
$BDTGLhiLO = 100 \pm 100 $	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	± 122.12						土0.00	± 0.00	土0.00	± 0.00	± 0.00	± 122.12
FF031 1100 1243 1001 1013 1000 1007 1006 1001 1203 1200 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 1201 <t< td=""><td>$\begin{tabular}{lllllllllllllllllllllllllllllllllll$</td><td></td><td></td><td></td><td></td><td></td><td></td><td>±0.00</td><td>±0.00</td><td>±0.00</td><td>±0.00</td><td>± 85.17</td><td>±0.00</td></t<>	$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$							±0.00	±0.00	±0.00	±0.00	± 85.17	±0.00
	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$							±0.07	±0.06	±0.00	± 0.32	± 76.23	00.00 + + 0.00
$ BDTC.hin.0 \qquad ED13 = 2.35 = 10.01 = 2.03 = 10.01 = 2.03 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10.01 = 10$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$						10.00		±0.05	£1.04	17.98	±03.78	00.0 H +
BDTGAhaa = 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 + 100 +	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$							8.0 H H	10.00 10.61	00.04	HU.U1 13	00.0H	HU.00
	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$							+0.00	+0.01	+0.00	+0.17	+41.85	00.01+
	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$						±0.00	± 0.00	+0.00	± 0.00	± 30.60	+0.00	+0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	±29.35					±0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	± 26.59						土0.00	± 0.00	± 0.00	± 0.00	± 26.59	± 0.00
$BDTG.bin.0 = \frac{8.55}{100} \pm 0.01 = 0.031 \pm 0.013 \pm 0.013 \pm 0.010 \pm 0.001 \pm 0.001 \pm 0.000 \pm 0$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	± 10.59						±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ BDTG_{\rm bin} = \frac{16.03}{100} \pm 0.00 \pm 0.0$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$							土0.01	± 0.22	± 0.00	± 3.26	± 11.81	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$							土0.00	±0.00	± 0.00	± 6.03	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$							±0.00	±0.00	±0.00	±0.00	± 0.00	± 5.47
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	±4.83						±0.00	± 4.83	±0.00	±0.00	±0.00	±0.00
	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	1.58 1.58						±0.00	±0.00	± 0.00	± 4.58	±0.00	±0.00
$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$							±0.08	±0.11	± 0.00	±0.10	± 4.25	00.0 1 1 1 0 0 0 0 0
$BDTG-hin.0 \qquad E0.01 \qquad E0.00 \qquad$	$ \begin{tabular}{l l l l l l l l l l l l l l l l l l l $	06.11H							00.0H	00.0 H			00.04
$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$	$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$	+0.70						+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$	±0.66						±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
$BDTG.bin.0 \begin{tabular}{lllllllllllllllllllllllllllllllllll$	$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$							土0.00	± 0.00	± 0.00	± 0.00	± 0.56	± 0.00
$ BDTG-bin.0 \mbox{4.0} 1 = 0.00 \mbox{4.0} 1$	$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$	± 0.46						土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	bs_BDTG_bin_0 ±0.42					±0.00	土0.00	± 0.42	土0.00	土0.00	± 0.00	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	± 0.16						± 0.16	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	± 0.13						±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$							00.00 ₩	00.01 10.00	00.0 ₩	00.0 1 1 1	00.00 + ±0.00	00.04 H
$ BDTGJhin, D = 10, 01 \pm 0, 00 \pm 0, 0$	$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$	0007							000++	0000+	0000+		8.04
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	+0.01						00.04	-00.00 +0.00	+0.00	+0.00	00.0+	00.0+
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	10.01						+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$	±0.00					±0.00	土0.00	±0.00	± 0.00	± 0.00	±0.00	±0.00
$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	±0.00						土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$DTG_{bin_0} \pm 0.00$					±0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	±0.00					±0.00	±0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	±0.00					±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	±0.00					0.00	00.0 ₩	+0.00	±0.00	±0.00	±0.00	00.0 1 1 00.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	00.0H							00.0H	00.01 H		00.01 1	00.0H
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$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	±0.00						±0.00	±0.00	± 0.00	±0.00	± 0.00	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$DTG_{bin_0} \pm 0.00$						土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	±0.00					±0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	±0.00						± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	10.00						土0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	±0.00					±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00
±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00	± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00	±0.00					±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
王0.00 E0.00	± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00	-0 ± ±0.00					±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
		±0.00						00.00 H H	±0.00	00.01 1	00.04 +	±0.00	00.00 + +
	+0.00 +0.00 +0.00	00.0H							00.0H	0000 H +	00.0H	00.0H	00.0

Table 5: Breakdown of the dominant systematic uncertainties on background estimates in CR_3^{DF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

und error ± 75.65 und error ± 75.65 und error ± 75.65 ub ± 75.65 ub ± 1285.36 ub ± 128.33 ub ± 128.33 ub ± 128.33 ub ± 128.33 ub ± 10.70 ub ± 128.33 ub ± 126			$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		$\begin{array}{c c} 0.37 \\ \hline 10.37 \\ $	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} 3990.16\\ \pm 167.39\\ \pm 540.34\\ \pm 263.66\\ \pm 10.9.70\\ \pm 10.9.70\\ \pm 10.9.70\\ \pm 10.9.70\\ \pm 0.00\\ \pm 0.00\\ \pm 238.20\\ \pm 0.00\\ \pm 238.20\\ \pm 238.20\\ \pm 238.20\\ \pm 0.00\\ \pm 0.$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
Ek ± 75.65 F ± 540.34 F ± 540.34 FXsec ± 391.97 EXscale ± 391.97 ± 853.36 ± 235.36 ± 858.26 ± 235.36 ± 119.70 ± 119.70 ± 112.36 ± 235.36 ± 757.34 ± 57.34 ΨY Sacc ± 42.39 Φ ± 57.64 Ψ energy scale ± 42.33 ΨY Sacc ± 42.33 Φ ± 119.70 Ψ ± 32.61 Ψ ± 32.61 Ψ ± 32.61 Φ ± 43.03 Φ ± 43.03 Φ ± 18.90 Φ ± 18.90 Φ ± 18.90 Φ ± 18.90 Φ ± 14.80 Φ ± 14.80 Φ ± 10.53 Φ ± 10.53 Φ ± 10.53 Φ <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>$\begin{array}{c c} \pm 0.67 \\ \pm 0.00 \\ \pm 0$</td> <td>$\begin{array}{c c} \pm 31.81 \\ \pm 31.81 \\ \pm 0.00 \\ \pm 1.12 \\ \pm 0.00 \\ \pm 1.12 \\ \pm 0.00 \\ \pm$</td> <td>$\pm 167.39$ ± 540.34 ± 263.66 ± 203.66 ± 203.66 ± 203.66 ± 203.66 ± 0.00 ± 119.70 ± 119.70 ± 119.70 ± 119.70 ± 119.70 ± 54.00 ± 138.20 ± 138.20 ± 138.90 ± 138.90 ± 0.00 $\pm 0.$</td> <td>$\begin{array}{c} \pm 126.62 \\ \pm 126.62 \\ \pm 20.00 \\ \pm 121.36 \\ \pm 121.00 \\ \pm 10.00 \\ \pm$</td>							$\begin{array}{c c} \pm 0.67 \\ \pm 0.00 \\ \pm 0$	$\begin{array}{c c} \pm 31.81 \\ \pm 31.81 \\ \pm 0.00 \\ \pm 1.12 \\ \pm 0.00 \\ \pm 1.12 \\ \pm 0.00 \\ \pm$	± 167.39 ± 540.34 ± 263.66 ± 203.66 ± 203.66 ± 203.66 ± 203.66 ± 0.00 ± 119.70 ± 119.70 ± 119.70 ± 119.70 ± 119.70 ± 54.00 ± 138.20 ± 138.20 ± 138.90 ± 138.90 ± 0.00 $\pm 0.$	$\begin{array}{c} \pm 126.62 \\ \pm 126.62 \\ \pm 20.00 \\ \pm 121.36 \\ \pm 121.00 \\ \pm 10.00 \\ \pm$
F ± 540.34 Txsec ± 540.34 Txy scale ± 285.36 ± 285.36 ± 285.36 ± 285.36 ± 285.36 ± 119.70 ± 0.049 ± 50.60 ± 119.70 ± 119.70 ± 0.1033 ± 45.03 t energy scale ± 57.34 t energy scale ± 45.03 t energy scale ± 25.15 t enerator ± 25.15 t enerator ± 55.15 ± 56.16							$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 1.12 ± 0.17 ± 0.17 ± 0.00 ± 0.00 ± 0.00 ± 0.00	± 540.34 ± 3391.97 ± 263.66 ± 199.70 ± 119.70 ± 60.49 ± 60.49 ± 60.00 ± 238.20 ± 338.20 ± 338.20	$\begin{array}{c} \pm 0.00 \\ \pm 0.00 \\ \pm 121.36 \\ \pm 121.36 \\ \pm 0.00 \\ \pm$
F F ± 54.03 Txsec ± 540.34 rey scale ± 121.36 rey scale ± 121.36 rey scale ± 121.36 rey scale $\pm 25.35.36$ renergy scale ± 50.49 renergy scale ± 50.60 renergy scale ± 50.60 renergy scale ± 25.060 renergy scale ± 233.261 renergy scale ± 233.261 renergy scale ± 243.33 renergy scale ± 243.33 renergy scale ± 243.33 renergy scale ± 25.16 renergy scale ± 25.16 renergy scale ± 25.16 renerator ± 25.16 Syste $\pm 26.10.0$ renerator ± 4.80 resolution ± 10.55 plus/sec ± 4.80 renerator $\pm 2.10.00$ renerator $\pm 2.50.60$ renerator $\pm 2.10.50$ renerator $\pm 2.10.50$ <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$</td> <td>$\pm 0.00$ ± 0.00 ± 3.00 ± 0.00 ± 0.00 ± 0.00 ± 20.00 ± 20.00 ± 20.00 ± 20.00 ± 0.00 ± 0.00</td> <td>± 540.34 ± 2631.67 ± 203.16 ± 10.70 $\pm 11.9.70$ ± 60.427 ± 54.27 ± 54.27 ± 10.00 ± 10.00 ± 138.20 ± 238.20 ± 138.20 ± 238.20 ± 238.2</td> <td>± 0.00 ± 10.00 ± 121.36 ± 121.36 ± 20.00 ± 20.00 ± 20.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00</td>							$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	± 0.00 ± 0.00 ± 3.00 ± 0.00 ± 0.00 ± 0.00 ± 20.00 ± 20.00 ± 20.00 ± 20.00 ± 0.00 ± 0.00	± 540.34 ± 2631.67 ± 203.16 ± 10.70 $\pm 11.9.70$ ± 60.427 ± 54.27 ± 54.27 ± 10.00 ± 10.00 ± 138.20 ± 238.20 ± 138.20 ± 238.20 ± 238.2	± 0.00 ± 10.00 ± 121.36 ± 121.36 ± 20.00 ± 20.00 ± 20.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00
x_{Aesc}							± 0.00 ± 0.00 \pm	本30.00 10 10 10 10 10 10 10 10 10	$\pm 263, 56$ $\pm 203, 66$ $\pm 109, 70$ $\pm 60.9, 70$ $\pm 54, 27$ $\pm 54, 27$ $\pm 20, 00$ $\pm 20, 00$ $\pm 18, 90$ $\pm 20, 000$ $\pm 0, $	$\begin{array}{c} \pm 0.00\\ \pm 121.36\\ \pm 0.00\\ \pm 0.00\\ \pm 0.00\\ \pm 35.70\\ \pm 0.00\\ \pm 10.00\\ $
$=mestar_Fakes_CR_obs_BDTG_bin_0$ ± 121.36 $EFSR$ ± 10.470 $EFSR$ ± 60.49 PSR ± 57.34 $VtXsec$ ± 50.60 $VtXsec$ ± 45.03 $Protector$ ± 23.30 $Protector$ ± 42.39 $Protector$ ± 42.39 $Protector$ ± 42.39 $Protector$ ± 23.92							$\begin{array}{c} \pm \pm 0.00\\ \pm 0.00\\ \pm \pm 0.00\\ \pm$	± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 1.12 ± 2.96 ± 2.96 ± 2.00 ± 2.00 ± 0.00 ± 0.00	± 0.00 $\pm 1.10.70$ ± 54.27 ± 54.27 ± 54.27 ± 0.00 ± 29.63 $\pm 2.9.63$ $\pm 2.9.63$ $\pm 2.9.63$ $\pm 2.9.63$ $\pm 2.9.63$ $\pm 2.9.00$ $\pm 1.8.90$ $\pm 1.8.90$ $\pm 1.8.90$ ± 0.000 ± 2.000 ± 2.0000 ± 2.00000 ± 2.00000 ± 2.00000 ± 2.00000 ± 2.00000 ± 2.00000 ± 2.000000 $\pm 2.000000000000000000000000000000000000$	$\pm 1_{21,36}$ ± 0.00 ± 0.0
LFSR ± 119.70 nPlusPS ± 60.49 tenergy scale ± 50.49 tenergy scale ± 55.34 VtXsec ± 45.03 tenergy scale ± 55.66 tenergy scale ± 45.03 tenergy scale ± 45.03 teneror ± 42.39 cenerator ± 32.61 teneror ± 23.26 teneror ± 23.64 teneror ± 25.44 teneror ± 4.56 teneror ± 4.56 plusXsec ± 4.56 plusXsec ± 4.56 cenerator ± 2.64 vWXsec ± 2.64 tenerator ± 2.64							$\begin{array}{c} \pm 0.00\\ \pm 0.00\\ \pm 0.00\\ \pm 10.00\\ \pm 10.00\\$	± 0.00 ± 0.00 ± 0.32 ± 1.12 ± 2.30 ± 2.00 ± 20.00 ± 0.00 ± 0.00	± 119.70 ± 60.49 ± 54.27 ± 54.27 ± 20.00 ± 23.20 ± 23.00 ± 33.00 ± 33.00 ± 33.00 ± 33.00 ± 33.00	± 0.00 ± 0.00 ± 35.70 ± 35.70 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00
nPlusPS ± 60.49 $VTXsec$ ± 50.60 $VTXsec$ ± 50.60 $VTXsec$ ± 43.03 D ± 33.40 $TTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTTT$							$\begin{array}{c} \pm 0.00\\ \pm 10.00\\ \pm 10.0$	± 0.00 ± 0.32 ± 1.12 ± 2.32 ± 2.00 ± 20.00 ± 0.00 ± 0.00	± 60.49 ± 54.27 ± 24.27 ± 0.00 ± 23.20 ± 29.63 ± 29.63 ± 18.90 ± 18.90 ± 18.90 ± 20.00 ± 20.00	± 0.00 ± 0.00
t energy scale ± 57.34 <i>VtXsec</i> ± 50.60 <i>VtXsec</i> ± 45.03 <i>VtXsec</i> ± 45.03 ± 43.03 ± 43.03 ± 43.03 ± 43.03 ± 43.03 ± 43.03 ± 43.03 ± 43.04 ± 30.40 ± 30.50 ± 4.50 ± 0.00 ± 2.50 ± 0.00 ± 0.00 \pm							$\begin{array}{c} \pm 20.00\\ \pm 10.00\\ \pm 10.$	± 0.32 ± 1.12 ± 1.12 ± 2.96 ± 2.96 ± 2.96 ± 2.96 ± 2.96 ± 2.00 ± 0.17 ± 0.00 ± 0.00 ± 0.000	± 54.27 ± 64.27 ± 0.00 ± 20.00 ± 29.63 ± 20.00 ± 18.00 ± 18.00 ± 20.00 ± 18.00 ± 0.00	± 0.00 ± 35.70 ± 35.70 ± 435.70 ± 40.00 ± 40.00 ± 20.00 ± 20.00 ± 10.00 ± 0.00 ± 0.00 ± 0.00
VIXsec ± 50.60 μ ± 50.60 μ ± 42.39 μ ± 42.30 μ ± 32.61 μ ± 32.61 μ ± 32.30 μ ± 32.30 μ ± 32.30 μ ± 32.30 μ ± 23.92 μ <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>± 0.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00</td> <td>± 0.00 ± 1.12 ± 2.96 ± 0.17 ± 30.40 ± 0.00 ± 0.00 ± 6.00</td> <td>± 0.00 ± 38.20 ± 29.63 ± 29.63 ± 0.00 ± 18.90 ± 0.00 ± 0.00</td> <td>± 30.00 ± 0.00 ± 0.00</td>							± 0.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00	± 0.00 ± 1.12 ± 2.96 ± 0.17 ± 30.40 ± 0.00 ± 0.00 ± 6.00	± 0.00 ± 38.20 ± 29.63 ± 29.63 ± 0.00 ± 18.90 ± 0.00 ± 0.00	± 30.00 ± 0.00 ± 0.00
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P ± 32.53 nerator ± 32.61 $= marator$ ± 32.61 $= marator$ ± 23.64 $= maratar$ ± 26.00 $= maratar$ ± 5.44 $= maratar$ ± 5.45 $= maratar$ ± 2.64 $= maratar$ ± 2.64 $= maratar$ ± 2.64 $= maratar$ ± 2.64 $= maratar$ ± 1.55 $= maratar$ ± 0.66 $= maratar$ ± 0.66 $= maratar$ ± 0.65							$\begin{array}{c} \pm \\ \pm $	± 2.30 ± 0.17 ± 30.40 ± 0.00 ± 0.00 ± 6.00	± 236.20 ± 29.63 ± 10.000 ± 18.90 ± 10.000 ± 2000	本 100 100 100 100 100 100 100 10
aerator ± 30.40 Generator ± 20.40 ± 30.40 ± 30.40 ± 30.40 ± 30.40 ± 30.40 ± 30.40 ± 10.53 ± 10.57 ± 10.53 $\pm $								本 1 1 1 1 1 1 1 1 1 1 1 1 1	± 0.00	++++0.00 +++++0.00 ++++0.00 +++0.00 +++0.00 +++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00
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± 18.90 ± 10.53 ± 6.00 ± 5.15 ± 5.15 ± 4.80 ± 2.56 ± 2.56 ± 2.56 ± 0.67 ± 0.67							十 十 十 十 十 十 十 十 十 十 十 十 十 十 十 十 十 十 十	年 10.00 10.00 10.00 10.00 10.00 10.00 10.00	± 18.90 ± 0.00 ± 20.00	±0.00 ±5.44 ±0.00 ±5.44 ±0.00 ±0.00 ±0.00 ±0.00
± 10.53 ± 10.53 ± 6.00 ± 5.15 ± 5.15 ± 4.80 ± 4.80 ± 2.56 ± 2.50 ± 2.50 ± 0.67 ± 0.67							0.00000000000000000000000000000000000	±0.00 1 ±0.00	00000 +++00000000000000000000000000000	± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00
$\begin{array}{c} \pm 5.00\\ \pm 5.15\\ \pm 5.15\\ \pm 4.80\\ \pm 4.80\\ \pm 2.56\\ \pm 1.55\\ \pm 1.55\\ \pm 0.67\\ \pm 0.67\end{array}$							10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 100 1	±6.00	±0.00 ±0.00	± 0.00 ± 5.44 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00
± 5.44 ± 5.44 ± 4.80 ± 4.86 ± 2.56 ± 1.55 ± 0.09 ± 0.09							00.00 + + 0.00 + + + 0.00		±0.00	± 3.44 ± 0.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00 ± 0.00
± 4.80 ± 4.56 ± 2.50 ± 1.55 ± 0.67 ± 0.65							0000 +++	13 24		1000000000000000000000000000000000000
± 4.56 ± 2.50 ± 1.55 ± 0.67 ± 0.67 ± 0.65		0+ 000+					000+	10.01 +0.00	00.0+	10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10 10.00 10.00 10.00 10.00 10.00 10 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00
$\begin{array}{c} \pm 2.50 \\ \pm 1.55 \\ \pm 1.55 \\ \pm 0.67 \\ \pm 0.67 \\ \pm 0.65 \end{array}$							2222	± 4.56	±0.00	±0.00 ±±0.00 ±0.00
± 1.55 ± 0.69 ± 0.67 ± 20.65			0.04 ± 0.28				± 0.00	± 0.10	± 3.02	±0.00 ±0.00 ±0.00
± 0.69 ± 0.65							土0.00	土0.00	土0.00	±0.00 ±0.00
± 0.65			$\pm 0.00 \pm 0.69$				±0.00	±0.00	±0.00	±0.00
		10.00 ±0.01	±0.00 ±0.00	00.0 1 1 1 0 0 0 1 1 0 0 0 1 1	00.0 1 1 1 0 0 0 1 1	±0.00	20.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	10.00 +0	±0.00	000+
$\alpha \operatorname{syst} Z \operatorname{Sec}$ ± 0.46						+0.00	+0.00	+0.00	+0.00	+0.00
at_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW$ _CR_obs_BDTG_bin_0 ± 0.42						± 0.42	土0.00	± 0.00	±0.00	土0.00
-0 ±0.16		土0.00 土0				± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$H_CR_{obs-BDTG_{bin-0}} \pm 0.13$						±0.00	±0.00	±0.00	±0.00	±0.00
$\alpha_{-Z}Z$ Generator ± 0.10 \pm		+0.00 +0	±0.00 ±0.00	10.10 +	±0.00	10.00 10.00	00.01 1 −	±0.00	±0.00	00.04 4
+Z CR obs BDTG bin 0 + $Z CR obs BDTG bin 0$	++ 20.0+		+0.00 +0.00			00.0++	0000+	00.0+	00.0+	00.04
±0.01 ±0.01						十0.00	±0.00	±0.00	±0.00	±0.00
±0.00						± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
中0.00						土0.00	土0.00	± 0.00	土0.00	± 0.00
一 一 一 一 一 一 一 0 0 0 0 0 0 0 0 0 0 0						±0.00	±0.00	±0.00	±0.00	±0.00
γ -snape-mcstat_ttW + $tt \neq ttW$ W _V K_ODS_BUIG_DIN_U ± 0.00 ± 1.00 ± 1.00			±0.00 ±0.00	00.0 1 1 0 0 0 1	00.0∏	00.0H	10.00 1	10.00 1	00.00 +	00.0 ₩
00.01	1+ 00.0+		00 + 0.00			+0.00	+0.00	+0.00	+0.00	+0.00
一 00.00						土0.00	± 0.00	± 0.00	±0.00	土0.00
± 0.00			土0.00 土0.00			± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
±0.00						±0.00	土0.00	土0.00	±0.00	土0.00
0 ±0.00			$\pm 0.00 \pm 0.00$			±0.00	±0.00	±0.00	±0.00	±0.00
±0.00	# + + + + 0000	+0.00 +0.00	$\pm 0.00 \pm 0.00$	+0.00 +	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
						00.01	10.00	00.0∏	00.00 +	00.0 1 1
hs RDTG hin 0 +0.00						00.0++	0000+	00.0+	00.0+	00.04
00.01 +0.00						+0.00	+0.00	+0.00	+0.00	+0.00
±0.00						±0.00	±0.00	±0.00	+0.00	±0.00
10.00							± 0.00	± 0.00	±0.00	土0.00
±0.00							± 0.00	± 0.00	± 0.00	± 0.00
±0.00						± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
-00 + 0.00						十0.00	土0.00	± 0.00	± 0.00	土0.00
±0.00					±0.00	±0.00	±0.00	±0.00	+0.00	±0.00
γ -snape-mcstat-W t_V A_0DS_BU LG_DM_U \rightarrow shape mcstat Fakes VR obs RDTC hin 0 +1	H + 00.0 H +		+0.00 ±0.00	00.0		10.00 +0.00	00.01 +	00.01 +0_00	000 +	00.0 1 1 1 0 0 0 0 1 0 0 0 1

Table 6: Breakdown of the dominant systematic uncertainties on background estimates in CR_3^{DF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Total background expectation Total background error	2474.07	0.39	125.66	3.48	83.11	0.14	7.04	13.89	0.00	90.54	2149.82	000
Total background error	10.11.1.7							AO.01	>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>>			0.00
	±381.48	± 0.39	± 29.52	± 0.52	± 25.31	± 0.04	± 1.04	土3.27	±0.00	土44.36	± 358.22	±0.00
Jet energy scale	± 222.30	± 0.03	± 10.18	± 0.45	± 5.94	± 0.00	± 0.52	± 0.75	±0.00	± 10.46	± 193.96	±0.00
α_systttXsec	± 214.98	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	± 214.98	±0.00
	±152.09	00.0∏	00.0 1 1	00.01 +0.00	00.0∏	00.0 1 1 1 0 0 0 1 1 0 0 0 1 1 0 0 0 1 0 1	±0.00	10.000 +0.000	±0.00	± 0.00	±152.09	00.0 ₩
a-urraruousuower	Но0.99 Н76 12		8 0 H H								Ноט.99 Н76 12	8.0 H H
	01.07 177.00		10.0H					HO.UL		00.0H	CT.0/H	
a-trigger Tet enemer weeelistion	H / 4. 44		но. Н	01.0H	H 4.49		17.0H	H0.42 H0 50		77.77 H 79.64	±04.49	8.0 H H
Ochonit anamir socia	140.10 + 10 80		00.0H		10.13			ec.ot		10.08	1240.00 127 45	
CellOut energy scare	Н 46.00 Н 40 4Б		100							1 40.30	131.40 140	
$\alpha = 2$ Generation	+25.13		+95,13						00.0+			
or IV/IV/Consustor					4.03 SG							
arr v Generator	+19.96	00.0+	+1.50	+0.01	+1.83	0000+	+0.11	00.01+	00.0+	+0.01	+15.87	00.0+
\sim shape mostat $t\bar{t}$ <i>CR</i> obs BDTG bin 0	+16.81	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+16.81	+0.00
ά PileUp	± 15.45	± 0.00	± 0.08	± 0.01	± 0.15	± 0.00	± 0.25	± 0.13	± 0.00	± 0.84	± 14.51	± 0.00
a_svstZXsec	± 13.58	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	+0.00	± 13.58	± 0.00	±0.00
Lumi	± 9.08	± 0.01	± 3.52	± 0.10	± 2.33	± 0.00	± 0.20	± 0.39	± 0.00	± 2.54	± 0.00	± 0.00
γ -shape-mcstat- Wt - CR -obs-BDTG-bin-0	± 7.75	± 0.00	± 7.75	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
α -syst WW Xsec	土4.16	土0.00	土0.00	土0.00	± 4.16	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00
γ -shape-mcstat-Z-CR-obs-BDTG-bin-0	± 3.92	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 3.92	±0.00	±0.00
a_syst I plus Asec	±3.06	±0.00	±0.00	±0.00	±0.00	± 0.00	#0.00	±3.06	±0.00	± 0.00	±0.00	#0.00
CeliOut energy resolution	12.24	10.01	±0.03	±0.02	±0.51	00.0 1 1 1 0 0	10.00 1 ± 0.00	±0.13	00.0∏	10.20 10.20	6T-77	00.0 ₩
γ -subpermission. W V $-Ch$ -obs_DD I G-DII $0 \sim s$ share mestat W Z CR obs BDTC bin 0	H 1.01		00.0 H H	00.04	10.1H		H0.00	00.0H				8.0 H +
are a support of the second seco	± 0.49	+0.00	+0.00	+0.00	+0.00	± 0.00	± 0.49	+0.00	± 0.00	± 0.00	± 0.00	+0.00
a_systtZXsec	± 0.39	± 0.39	±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
tor	± 0.36	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.36	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW$ _CR_obs_BDTG_bin_0	± 0.34	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.34	± 0.00	± 0.00	± 0.00	± 0.00
mu_ttDF	± 0.21	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	± 0.21	土0.00
γ-shape-mcstat-H-CR-obs-BDTG-bin-0	± 0.21	±0.00	±0.00	± 0.21	±0.00	± 0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00
7-suapernicstate 27 7B obs. BDTC him 0	H0.04	#0.0#				00.0H						
$\sim ZZG$ enerator	+0.01+	00.0+	8.0	00.0+	000+	20.0+	00.0+	00.01+	00.0+	000+	00.0+	8.0
or svst Z Z X sec	+0.01	+0.00	+0.00	+0.00	+0.00	+0.01	+0.00	00.01+	+0.00	+0.00	00.04	0.00+
\sim shape mostat DY CR obs BDTG bin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat- $Fakes$ - CR -obs-BDTG-bin-0	土0.00	土0.00	土0.00	土0.00	土0.00	±0.00	土0.00	±0.00	土0.00	土0.00	±0.00	土0.00
$\dot{\gamma}$ -shape-mcstat- $t\bar{t}$ - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW_VR_obs_BDTG_bin_0$	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00
γ -shape-mcstat- WW - SR -obs-BDTG-bin-0	± 0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00
γ_shape_mcstat_W Z_V K_obs_BDT G_bm_0	±0.00	00.0	00.0 1 +	10.00 +	00.0∏	±0.00	#0.00	±0.000	±0.00	± 0.00	00.01 1	00.00 #
γ_snape_mostat_tt_V Λ_ODS_DD I G_DNI_U ~ chone mostet +Z VR che RDTC him D	00.01 H		8.0 H H			00.0 H +				00.0 H +	00.04	8.0 H +
γ -shape-mestat- Wt - SR -obs-BDTG-bin-0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat-ZZ-VR-obs-BDTG-bin-0	±0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	±0.00	±0.00	± 0.00	± 0.00	± 0.00	±0.00
γ _shape_mcstat_Z_SR_obs_BDTG_bin_0	+0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	+0.00	± 0.00	±0.00	±0.00
$\gamma_{-shape-mcstat}DY_VR_obs_BDTG_bin_0$	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
α -FakesSyst	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- WZ - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $t\bar{t}W + t\bar{t}Z + t\bar{t}WW$ -SR-obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $Fakes$ - SR -obs-BDTG-bin-0	土0.00	土0.00	土0.00	土0.00	土0.00	± 0.00	土0.00	土0.00	土0.00	土0.00	± 0.00	土0.00
γ -shape_mcstat_Z_VR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00
γ -shape-mestat- DY - SR -obs- $BDTG$ -bin- 0	± 0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ-shape-mcstat-tZ_SK-obs-BD'I'G-bin-0	+0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat-ZZ-SR-obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00
γ -snape-mcstat-W W -V K_oDS_BUTG-Din_U	00.01 +	±0.00	00.0 1 +	±0.00	00.0∏	10.00 1 ± 0.00	±0.00	10.000 +0.000	±0.00	± 0.00	00.01 1	00.0 1 1 1
γ -suape-mcstate $T/I = V n_{-}008$ -DU I G-DIII-0 \sim chang meetat $W + V R$ che RDTC hin D	00.01 H		8.0 H H			00.0 H +				00.0 H +	00.04	8.0 H +
γ -shape-mestat- $Fakes-VR_obs$ -BDTG-bin-0	±0.00	中 10.00 10.01	±0.00	±0.00	±0.00	±0.00	十0.00	±0.00	±0.00	±0.00	±0.00	00.00 ∓

Table 7: Breakdown of the dominant systematic uncertainties on background estimates in CR_4^{DF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Olicer tailing of chaliner	0.14	1										
Total background expectation	2281.01	0.39	125.66	3.48	83.12	0.14	7.04	13.89	00.00	90.54	1956.76	0.00
Total background error	± 118.54	± 0.39	± 29.33	± 0.52	土25.14	± 0.04	± 1.03	± 3.25	±0.00	土44.07	± 135.37	土0.00
$mu_t\bar{t}DF$	± 326.61	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 326.61	± 0.00
Jet energy scale	± 203.83	± 0.03	± 10.12	± 0.45	± 5.91	±0.00	± 0.51	± 0.75	±0.00	± 10.40		±0.00
α -syst tt Xsec	± 194.39	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	± 194.39	±0.00
$\alpha_{-ttISRFSR}$	± 110.88	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 110.88	±0.00
$\alpha_{-ttPartonShower}$	± 77.75	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 77.75	±0.00
α_{-tt} Generator	± 68.85	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 68.85	±0.00
α_trigger	197.97 - 40.19	±0.01	±3.74	±0.10	±2.48	± 0.00	±0.21	±0.41	±0.00	1 40 10	±58.31	00.0 ₩
α_ΔGenerator	±40.18	±0.00	H 0.01	±0.00	±0.00	± 0.00	±0.01	±0.00	±0.00	±40.18		00.0 1 1 0 0 0 1 0 0 0 1
Jet energy resolution	±39.80 - 20.10	±0.01	0/.0∓	±0.03	±0.79	±0.02	±0.01	±0.04	±0.00	12.04 - 0.01	±30.90	00.0 ₩
CellOut energy scale	104.06 - 04.06	10.01	H0.07	70.07	10.03	00.0 1 −	±0.04	10.02	00.0H	00.00 -	H00.01	00.0 ∏
CLESSENT LASEC	H 24.90 H 23 70		H 24.90		H0.00				00.0H			8 0 H H
a IVF Generator	+18.42	00.04	+1 49	0.01+	+1.82	000	0.01	00.01 +0.00	00.0+	+0.61	± 14.36	8.0
\sim share mostat $t\bar{t}$ <i>CB</i> obs BDTG hin 0	+15.22	+0.00	000+	+0.00	10.00+	+0.00	+0.00	+0.00	00.0+	000+	+15.22	+0.00
α_PileUp	± 14.06	±0.00	± 0.08	± 0.01	± 0.15	±0.00	± 0.25	± 0.13	土0.00	± 0.83	± 13.12	+0.00
α -systZXsec	± 13.49	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 13.49		± 0.00
Lumi	± 9.04	± 0.01	± 3.50	± 0.10	± 2.32	± 0.00	± 0.20	± 0.39	± 0.00	± 2.52		± 0.00
γ -shape_mcstat_Wt_CR_obs_BDTG_bin_0	土7.71	土0.00	土7.71	土0.00	土0.00	土0.00	土0.00	十0.00	± 0.00	土0.00	±0.00	十0.00
a_systWWXsec	± 4.13	±0.00	±0.00	±0.00	± 4.13	± 0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00
γ_shape_mcstat_Z_CK_obs_BD'IG_bin_0	±3.90	±0.00	± 0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	±3.90	±0.00	#0.00 -
CollOut anomy mechanica	H 0.04		00.0H		00.0H			H0.04		10.00 1	10.00	
\sim shape mostat $WWCR$ obs BDTC hin 0	1 - 20	+0.00	C0.00+	10.01	+1.60	000+	00.0+	00.0+	00.0+	0000+	00 0+	0000+
γ -shape-mcstat- WZ - CR -obs-BDTG-bin-0	± 0.52	±0.00	±0.00	土0.00	±0.00	±0.00	± 0.52	±0.00	±0.00	±0.00	±0.00	±0.00
$\alpha_{\rm syst}WZX$ sec	± 0.49	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.49	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
α -systtZXsec	± 0.38	± 0.38	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\alpha_W Z$ Generator	± 0.36	土0.00	±0.00	±0.00	± 0.00	±0.00	± 0.36	十0.00	± 0.00	± 0.00	±0.00	±0.00
γ -shape-mcstat_ttW + ttZ + ttWW_CR_obs_BDTG_bin_0	± 0.34	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	± 0.34	±0.00	± 0.00	±0.00	±0.00
γ-shape-mestat-H-CK-obs-BUTG-bin-U	17.07	10.00 1	00.00 H H	17.0 1	00.0±	00.01 + 0.00	00.0 1 1	±0.00	±0.00	00.01 + 0.00	10.00 +0.00	00.01 1
~ shape mostat ZZ CB obs BDTG hin 0	+0.04	#0.00 +	0000	00.0+	00.0+	+0.03	00.04	00.0+	00.0+	000+	00.0+	0000+
$\alpha_Z Z Generator$	± 0.01	±0.00	±0.00	±0.00	±0.00	± 0.01	±0.00	±0.00	±0.00	±0.00	+0.00	±0.00
α -syst Z X sec	± 0.01	± 0.00	±0.00	± 0.00	± 0.00	± 0.01	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $Fakes$ - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ DY _ $CR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_tt_SR_obs_BDTG_bin_0	± 0.00	土0.00	土0.00	±0.00	± 0.00	± 0.00	± 0.00	十0.00	± 0.00	± 0.00	土0.00	土0.00
с -	+0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mestat- <i>it W</i> + <i>it \Lambda</i> + <i>it W W</i> - <i>V</i> - 008-DD 1 G-011-0	00.00 H H		B 0						00.0H			8 0 H H
vehane mostat W/W/SR obs BDTC bin 0	00.0+		0.0		00.0+	000		00.01 +0.00	00.0+	000 +	00.01+	8.0
γ -shape-mestat- tZ_VR_{obs} -BDTG_bin_0	± 0.00	+0.00	+0.00	± 0.00	± 0.00	± 0.00	+0.00	± 0.00	± 0.00	± 0.00	+0.00	± 0.00
$\gamma_{\rm shape-mcstat-t\bar{t}-VR_obs_BDTG_bin_0}$	± 0.00	±0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_Wt_SR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ZZ_VR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-Z-SR_obs_BDTG_bin_0	±0.00	十0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00
γ -shape_mcstat_ $DY_VR_obs_BDTG_bin_0$	±0.00	十0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00
a_FakesSyst	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- W Z-SK-obs-BDTG-bin-0	±0.00	±0.00	00.0 1 1	00.0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	00.0±	± 0.00	±0.00	±0.00	±0.00	± 0.00	00.00 +	00.04 4
7_Shape_IIICSide_10 W + 112 + 11 W W _2 A_008_DU 1 G_011_0	0.00 H H		0.0 H H									
× shape mostat Z V R obs BDTG hin 0	00.0 +	0000+	0000+	00.0+	00.04	0000+	00.01	00.01 +0.00	+0.00	00.0 +	00.0+	00.0+
γ -shape_mcstat_ DY _ SR -obs_BDTG_bin_0	± 0.00	±0.00	±0.00	土0.00	±0.00	±0.00	±0.00	±0.00	土0.00	± 0.00	±0.00	+0.00
γ -shape-mcstat_tZ_SR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ZZ_SR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $WW_VR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $H_VR_{obs-BDTG_{bin-0}}$	±0.00	±0.00	±0.00	十0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- $Wt_VR_obs_BDTG_bin_0$	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
\sim shane mostat $Fakes VB$ obs BDTG hin 0	+0.00	000+										

Table 8: Breakdown of the dominant systematic uncertainties on background estimates in CR_4^{DF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Total background expectation												
	270.32	0.02	16.71	0.18	14.41	0.01	0.75	1.58	0.00	1.03	235.62	0.00
Total background error	土39.34	± 0.02	土4.78	土0.06	土6.39	± 0.02	±0.87	± 0.38	±0.00	± 1.06	± 38.55	±0.00
α -systt $t\bar{t}X$ sec	± 23.56	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 23.56	± 0.00
α_{-tt} Generator	± 17.67	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	土0.00	±0.00	±0.00	± 17.67	±0.00
CellOut energy scale	± 14.19	±0.00	± 0.64	± 0.01	± 0.22	±0.00	± 0.04	± 0.02	±0.00	± 0.01	± 14.63	±0.00
$\alpha_{-t\bar{t}}$ ISRFSR	± 10.71	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 10.71	± 0.00
$\alpha_{-tt} Parton Shower$	± 9.42	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 9.42	± 0.00
α -trigger	± 8.11	± 0.00	± 0.50	± 0.01	± 0.43	± 0.00	± 0.02		± 0.00	± 0.03	± 7.07	± 0.00
Jet energy resolution	± 7.32	± 0.01	± 0.24	± 0.01	± 0.72	± 0.00	± 0.09		± 0.00	± 0.03	± 8.40	± 0.00
a_PileUp	± 7.23	± 0.00	± 0.08	± 0.00	± 0.30	± 0.00	± 0.03		± 0.00	± 0.04	± 6.86	± 0.00
αWW Generator	+6.13	+0.00	+0.00	+0.00	+6.13	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
\sim share mostat $t\bar{t}$ <i>CB</i> obs BDTG hin 0	+5 50	000+	000+	000+	000+	000+	1000+		000+	000+	+2,50	000+
Control of the second second of the second of the second sec	10000		10.07									
α = β =	#00C+		#0.0T									
γ -shape-mostat- <i>W</i> t- O <i>R</i> -008-DD 1 G-011-0	00.7 H -	00-04-	00.7 H -	00.0H		0.04 H -	0.0 H -		00.0H	00.0H	н. Н.	00-04-
	±2.34	± 0.00	±0.41	±0.00	±0.37	± 0.00	T0.01		±0.00	±0.01		±0.00
CellOut energy resolution	± 2.30	± 0.00	± 1.55	± 0.00	± 0.27	± 0.00	± 0.10		± 0.00	± 0.05		± 0.00
Jet energy scale	± 1.33	± 0.00	± 0.02	± 0.04	± 1.05	± 0.00	± 0.06		± 0.00	± 0.16		± 0.00
$\alpha Z Generator$	± 1.03	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 1.03	± 0.00	± 0.00
Lumi	± 0.97	± 0.00	土0.47	± 0.01	± 0.40	± 0.00	± 0.02	± 0.04	± 0.00	± 0.03	± 0.00	± 0.00
$\alpha_{-}WZ$ Generator	± 0.83	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.83		± 0.00	± 0.00	± 0.00	± 0.00
$\alpha_{\mathrm{-syst}}WW\mathrm{Xsec}$	± 0.72	± 0.00	± 0.00	± 0.00	± 0.72	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mestat- $WWCR$ obs-BDTG_bin-0	± 0.67	± 0.00	± 0.00	± 0.00	± 0.67	± 0.00	± 0.00		± 0.00	± 0.00		± 0.00
	+0.35	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00		+0.00
\sim shape mostat $WZ \ CR$ obs BDTG hin 0	61.0+	+0.00	+0.00	+0.00	+0.00	+0.00	+0.19		00.0+	+0.00		00.0+
	+0.15	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		00.0+	+0.15		00.0+
\sim share most at $t\bar{t}W \pm t\bar{t}Z \pm t\bar{t}WW \ CR$ obs BDTG bin 0	110	000+	000+	000+	00 0+	000+	000+		000+	000+	000+	000+
\sim shape mostat Z <i>CR</i> obs BDTG hin 0	10.04	000+	000+	000+	000+	000+	000+		000+	80.0+	000+	000+
v svet W/ 7 Year	10.04						10.04		00.0+			
\sim share most at $H \subset R$ ohe BDTC hin 0	1000								00.0+			
$\gamma = 0.00$												
		3 8				8.0						
c. 77 Concerton	10.04					8.04						
~ share mestat ZZ CR ohs RDTC hin 0	10.0+					100+		00.0+	00.0+			
\sim shape mostat $tZ CB$ obs BDTG bin 0	+0.01	+0.01	+0.00	+0.00	+0.00	+0.00	+0.00		00.0+	+0.00	000+	+0.00
or svst/Z/Z/Sec	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		00.0+	+0.00	+0.00	00.0+
\sim share mostat $DY CB$ obs BDTG hin 0	000+	+0.00	+0.00	+0.00	+0.00	000+	+0.00		00.0+	+0.00	000+	00.0+
\sim -shape-mestat- $Fakes-CR$ -obs-BDTG-bin-0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
γ shape mostat $t\bar{t}$ SR obs BDTG bin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00		+0.00
\sim share mostat H SR obs BDTC hin 0	00.0+	000+	000+	000+	000+	000+	000+		000+	000+		000+
\sim share mostat $t\bar{t}W + t\bar{t}Z + t\bar{t}WW V R$ ohs BDTG hin 0	000+	000+	000+	000+	00.04	000+	000+		00 0+	000+		000+
	000+	+0.00	+0.00	+0.00	+0.00	000+	+0.00		00.0+	+0.00		00.0+
\sim share mostat $t\bar{t} VR$ obs BDTC bin 0		000+	000+		00.0+	8.0	000+	00.01+	00.0+	000+		00.0+
\sim share mostat $tZ VR$ obs BDTC bin 0	000+	800++			000+	800+			00.0+		000+	000+
\sim shape mostat Wt SR obs BDTG hin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		00.04	+0.00	+0.00	+0.00
\sim shape mostat ZZ VR obs BDTG bin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00		+0.00
\sim shape mostat Z SR obs BDTG hin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	00.04	00.0+	+0.00	+0.00	00.0+
\sim shape mostat $DY VR$ obs BDTG bin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00		+0.00
or FakesSvst	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
\sim shape mostat WZ SR obs BDTG hin 0	+0.00	+0.01	+0.00	+0.00	+0.00	+0.00	+0.00		00.0+	+0.00		00.0+
γ -shape_mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW_{-}SR_{-}obs_{-}BDTG_{-}bin_{-}0$	+0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		+0.00	± 0.00	+0.00	± 0.00
γ -shape-mcstat- $Fakes$ - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00		± 0.00
γ -shape-mcstat_Z_VR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00		± 0.00
$\gamma_{\rm shape-mcstat-}DY_SR_{\rm obs.}BDTG_{\rm bin_0}$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00		± 0.00
\sim -shape-mcstat- tZ - SR -obs-BDTG-bin-0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00		+0.00
\sim shape mostat ZZ SR obs BDTG bin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00		+0.00
\sim share mostat $WW VR$ ohs RDTG hin 0	00.0+	000+	000+	000+	000+	000+	000+		000+	000+		000+
	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00		+0.00
\sim share mostat $W + VR$ ohs BDTC hin 0	00.0+	000+	000+	000+	000+	000+	000+		000+	000+	000+	000+
\sim shape mostat $Fakes VR$ obs BDTG hin 0												

Table 9: Breakdown of the dominant systematic uncertainties on background estimates in CR_5^{DF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

$ \ \ \ \ \ \ \ \ \ \ \ \ \ $	Uncertainty of channel	CR5-	71	2 11		44 44	3	7 7	ttW + ttZ + ttWW	1			
18.47 10.0 4.15 6.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 4.00 <t< td=""><td>Total background expectation</td><td>311.09</td><td>0.02</td><td></td><td>0.18</td><td>14.41</td><td>0.01</td><td>0.75</td><td>1.58</td><td>0.00</td><td>1.03</td><td>276.38</td><td>0.00</td></t<>	Total background expectation	311.09	0.02		0.18	14.41	0.01	0.75	1.58	0.00	1.03	276.38	0.00
$ \label{eq:constraints} \ \ \ \ \ \ \ \ \ \ \ \ \ $	Total background error	± 18.47	± 0.02	4	±0.06	± 6.35	± 0.01	± 0.86	± 0.38	土0.00	± 1.05	± 20.22	±0.00
$ \label{eq:constraints} \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$													
	mu_{ttDF}	± 48.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00		±0.00
$ eq:constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_const$	α -systiftsec	±27.48	±0.00	± 0.00	00.0±	±0.00	00.0 ₩	± 0.00	±0.00	±0.00	00.0 1 1 0 0 0 0 1 0		±0.00
$ eq:constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_constrained_const$	α_ttGenerator	±20.09	8.0 1 1 1	±0.00	10.01 10.01	00.0 1 1 0 0 0 1	00.0 1 1	00.0 1 1 0 0 1	±0.00	00.0 1 1 0	10.0 10.0		00.0 1 1 0 0 0 1
eq:eq:eq:eq:eq:eq:eq:eq:eq:eq:eq:eq:eq:e	CellOut ellelgy scare	10.00 110.08		+0.04		77.0T			70.02 T				
		10.30 +10.38											
	a trimer	40.00		H0.20	0.0H	00.0H		00.0H	20.01 H		00.0H		
	u-uiggei Jet energy resolution	12.04	0.01	+0.23	+0.01		8.0	10.04	20.07 +	000+	+0.03		00.0+
	or PileIIn	- x + + +	10.01+	80.0+	10.01	+0.30	0000+	+0.03	+0.01	0000+	+0.04		0000+
	$\sim shape-mestat_t \overline{t} C R_o bs_B D T G_b in_0$	+6.42	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00
	$\alpha_{-}WW$ Generator	± 6.09	±0.00	±0.00	±0.00	± 6.09	±0.00	± 0.00	±0.00	±0.00	±0.00		±0.00
	$\alpha_{\rm syst}Wt$ Sec	+3.32	± 0.00	± 3.32	± 0.00	± 0.00	± 0.00	± 0.00	+0.00	± 0.00	± 0.00		± 0.00
	γ _shape_mcstat_W t_CR_obs_BDTG_bin_0	± 2.84	±0.00	± 2.84	±0.00	±0.00	±0.00	±0.00	± 0.00	± 0.00	±0.00		±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	a_JVF	± 2.59	± 0.00	± 0.41	± 0.00	± 0.37	± 0.00	± 0.01	±0.00	± 0.00	± 0.01		± 0.00
$ \begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	CellOut energy resolution	± 2.45	± 0.00	± 1.54	± 0.00	± 0.27	± 0.00	± 0.10	±0.00	± 0.00	± 0.05		± 0.00
$ \begin{tabular}{l l l l l l l l l l l l l l l l l l l $	Jet energy scale	± 1.35	± 0.00	± 0.02	± 0.04	± 1.04	± 0.00	± 0.06	土0.01	± 0.00	± 0.16		± 0.00
$ \begin{tabular}{l l l l l l l l l l l l l l l l l l l $	$\alpha Z Generator$	± 1.03	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 1.03		± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Lumi	± 0.97	± 0.00	± 0.47	± 0.01	± 0.40	± 0.00	± 0.02	± 0.04	± 0.00	± 0.03		± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	αWZ Generator	± 0.82	±0.00	±0.00	± 0.00	± 0.00	±0.00	± 0.82	±0.00	± 0.00	±0.00		± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		± 0.72	±0.00	±0.00	±0.00	± 0.72	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00
$ \begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	W W_CK_ODS_BUTUG_DIN	±0.0 10.0	±0.00	± 0.00	±0.00	±0.0±	00.0 ₩	± 0.00	±0.00	±0.00	±0.00		±0.00
$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$		H0.34	8 0 1 1	00.0H	00.0 ∏ +			100.00	HU.34				
$ B_{a} BDTG-hin 0 = 111 \pm 0.00 \pm 0.$		+0.15		+0.00	+0.00	+0.00	+0.00	+0.00	00.01	+0.00	+0.15		+0.00
	γ -shape-mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WWCR_obs_BDTG_bin_0$	± 0.11	±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.11	± 0.00	±0.00		± 0.00
	γ -shape-mcstat-Z-CR_obs_BDTG_bin_0	± 0.08	土0.00	土0.00	土0.00	土0.00	土0.00	± 0.00	土0.00	土0.00			土0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	a-systWZXsec	± 0.05	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.05	±0.00	±0.00			±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- H - CK -obs- BD IG-bin- 0	40.0±	9.0 1 1	± 0.00	£0.05	±0.00	00.04 4	0.00 + +	±0.00	00.0	00.0 ₩		100.01 00.01
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	a-sysuzasec 2 shane mostat ZZ CR ahe RDTC hin 0	70.07 +0.01	70.07 H + 0.07	0.00 H +			B 6	00.0 H H			8.0 H +		
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\alpha_Z Z$ Generator	± 0.01	±0.00	±0.00	±0.00	±0.00	± 0.01	± 0.00	±0.00	±0.00	±0.00		±0.00
$ \begin{array}{c} \label{eq:constraints} \mathbf{D} & = 10,0 & \pm 0,00 & \pm$	γ -shape-mcstat_tZ_CR_obs_BDTG_bin_0	± 0.01	± 0.01	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	α -syst ZZ sec	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00		土0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- $Fakes_{-}CR_{-}obs_{-}BDTG_{-}bin_{-}0$	十0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	十0.00	±0.00		十0.00
$ \begin{array}{c} bs. BDTG. bin. 0 & \pm 0.00 & \pm 0$	γ -shape-mcstat- DY - CR -obs- BD TG-bin-0	±0.00	0.00 ++	±0.00	±0.00	#0.00	±0.00	±0.00	± 0.00	±0.00	00.00 +		#0.00
$ bs. BDTG.bin.0 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ 1000 \ \ \ 1000 \ \ 1000 \ \ \ 1000 \ \ \ 1000 \ \ \ 1000 \ \ 1000 \ \ \ 1000 \ \ \ 1000 \ \ \ 1000 \ \ \ 1000 \ \ \ 1000 \ \ \ 1000 \ \ \ \$	γ_snape_mcstat_tt_Sh_obs_BUIG_bin_U	00.04	8.0 1 1	00.0 	00.0 ∏	00.04	00.0 ₩	00.0	00.0H	00.0H	00.0 H H		00.04 1
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		+0.00	00.00+	+0.00	+0.00	+0.00	00.01+	+0.00	00.01+	+0.00	+0.00		+0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		±0.00	土0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00		±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- WW - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00		± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ _shape_mcstat_tZ_VR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape_mcstat_tt_VR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- $W t$ - SR -obs- $BDTG$ -bin- 0	±0.00	00.0 1 -	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	7_Shape_mestat_Z Z_V A_ODS_DU1G_DII_U	00.0H	00.0 1 + 0	10.00 1 ± 0.00	n	00.0∏	00.0 ₩ +	00.01 +	10.00	00.0 1 1 0 0 0 1	00.0H		00.0∏ +
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-intestat $DV VR$ obs BDTC bin 0 ~ shape mestat $DV VR$ obs BDTC bin 0	00.0H	8.0 H +	00.0H		00.0H	B 00 H +	00.0 H +	00.0H				00.04
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	7 - Budge-mostar-L 1 - V 11-000-L L C-DIII-0	0000+	000+	000 +	00.0+	000+	8.0	000+		000+	000+		00.0+
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		00.0+	+0.00	+0.00	+0.00	+0.00	00.04	+0.00	00.01+	+0.00	+0.00		+0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape_mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW_{-}SR_{-}$ obs_BDTG_bin_0	+0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	+0.00	± 0.00	± 0.00		± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- $Fakes$ - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00		± 0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat_Z_VR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00		± 0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat_ DY _ SR -obs_ $BDTG$ _bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	γ _shape_mcstat_tZ_SR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00
本0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.0		± 0.00	土0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	土0.00	± 0.00	土0.00		± 0.00
王0.00 E0.00 E0.0	-	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00
	γ -shape-mcstat- <i>H</i> - <i>V R</i> -obs- <i>BD</i> TG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00		±0.00
	γ _shape_mcstat_W t_V K_Obs_BDTG_Din_U \sim shape mcstat $Fakes VR$ obs BDTG bin 0	00.0 +0	8.0 +	00.0 +	00.0 +	00.0 +0.00	00.0 ₩+	00.0 # +	±0.00 +0.00	00.0 +	00.0 # +		00.0#+

Table 10: Breakdown of the dominant systematic uncertainties on background estimates in CR_5^{DF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

$ \ \ \ \ \ \ \ \ \ \ \ \ \ $	Total background expectation												
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		379	0.05	29.62		27.23	0.04	1.92	2.80	0.00	6.00	311.43	0.00
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Total background error	32干		±7.84	± 0.20	±10.78	± 0.03	± 0.62	土0.69	±0.00	00	± 76.22	土0.00
	$\alpha_{-t\bar{t}}$ ISRFSR	十58		±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 58.44	± 0.00
	α -syst tt Sec	±31		±0.00	±0.00	0.00	±0.00	00.01	±0.00	±0.00	±0.00	± 31.14	00.01
	Jet energy scale	+7 -	=0.01	± 3.13	土0.08	± 1.56	±0.00	± 0.09	± 0.18	±0.00	± 0.97	± 19.71	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	α_{-tt} Generator	+2	-0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	± 23.21	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	α_{-tt} PartonShower	±11		±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 12.46	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	CellOut energy scale	11		± 0.88	± 0.01	± 0.40	± 0.00	± 0.05	± 0.03	± 0.00	± 0.08	± 10.74	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	α -trigger	17		± 0.89	± 0.02	± 0.82	± 0.00	± 0.06	± 0.08	± 0.00	± 0.18	± 9.34	± 0.00
	αWW Generator	十1(±0.00	± 0.00	± 10.44	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	α -ZGenerator	# 8	=0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 8.45	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Jet energy resolution	2干	=0.00	土0.46	± 0.15	± 0.23	± 0.00	± 0.20	± 0.16	± 0.00	± 0.18	± 7.29	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- $t\bar{t}$ - CR -obs-BDTG-bin-0	年6	=0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 6.45	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	a_PileUp	年6		± 0.45	± 0.01	± 0.15	± 0.00	± 0.05	± 0.01	± 0.00	± 0.06	± 5.83	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	α _systWtXsec	±5		± 5.92	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ _shape_mcstat_ $Wt_CR_obs_BDTG_bin_0$	+3		± 3.58	± 0.00	+0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	+0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	α.JVF	+		+0.70	+0.00	+0.63	+0.00	+0.01	+0.00	+0.00	+0.05	+1.79	+0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	CellOut energy resolution	+		+0.69	+0.03	+0.44	+0.00	+0.29	+0.08	+0.00	+0.41	+2.77	+0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Lumi	1+		+0.83	+0.02	+0.76	+0.00	+0.05	+0.08	+0.00	+0.17	00.01+	+0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\alpha_{\mathrm{syst}}WW\mathrm{Xsec}$	+		+0.00	+0.00	+1.36	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- WW - CR -obs-BDTG-bin-0	0#		±0.00	± 0.00	± 0.93	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\alpha_{\rm syst}ZXsec$	0#	-0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.90	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\alpha_{\rm -systTplusXsec}$	0#		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.61	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape_mcstat_Z_CR_obs_BDTG_bin_0	0#		±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.38	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	αWZ Generator	0#		±0.00	土0.00	± 0.00	± 0.00	± 0.36	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ shape_mcstat_ $WZ_CR_obs_BDTG_bin_0$	0+	-0.00	± 0.00	± 0.00	+0.00	± 0.00	± 0.30	± 0.00	± 0.00	± 0.00	+0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ _shape_mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WWCR_obs_BDT$		=0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.15	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	α -systWZXsec		=0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.13	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ _shape_mcstat_H_CR_obs_BDTG_bin_0	0#	=0.00	± 0.00	± 0.10	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	α -systtZXsec	0#	±0.05	±0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$mu_t \bar{t} DF$	0干	=0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.03	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\alpha_Z Z Generator$	0#	=0.00	± 0.00	± 0.00	± 0.00	± 0.02	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- $ZZ_CR_obs_BDTG_bin_0$	0	=0.00	±0.00	土0.00	± 0.00	± 0.02	± 0.00	土0.00	土0.00		± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ _shape_mcstat_tZ_CR_obs_BDTG_bin_0	0#	±0.01	±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	α _systZZXsec	0#	=0.00	±0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- DY - CR -obs-BDTG-bin-0	0	=0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- $Fakes$ - CR -obs-BDTG-bin-0	0	=0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape_mcstat_tt_SR_obs_BDTG_bin_0	0 1	=0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
$ \begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\$	γ -shape_mcstat_H_SR_obs_BD'I'G_bin_0		=0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat-ttW + ttZ + ttW W -V K-obs-BU'I		0.00	± 0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00		±0.00	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ-snape-mcstat-W W - J K-ODS-LU L G-DIII-U	о с Н -	0.02	0.00 	00.0±	00.0∄	± 0.00	±0.00	±0.00	±0.00		00.0∏	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ-snape-mcstat-W Z-V K-obs-BD I G-bin-U	0 0 H -	00.02	± 0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	00.0 ₩	n	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	TSHAPE-INCSUAL-ULV ALODSEDUICULU	р с Н Н					00.00 H H				8 0 H H		
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Trape_IIICstate U/A CD obs DDTC him 0	H H											
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		H H	0.0										
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ-snape-mcstat-ZZ-V R_ODS_BUIG_DIN_U	р с Н -	0.00	00.00 ₩	n	±0.00	10.00 ₩	00.0∏	±0.00	±0.00	0.0 ₩	00.0∏ -	00.0∏
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Y_Shape_mcstat_Z_J_L_ODS_D_J_L_DIn_U	H -		00.01	00.04	00.0H	00.0 1 + 0	nn.n +	10.00	00.0H	8.0 H +	00.01 H	00.0H
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ_snape_mcstat_D r_v n_obs_B D LG_DIn_U	р с Н -	0.00	00.00 ₩	n	±0.00	± 0.00	00.0∏	±0.00	±0.00	0.0 ₩	00.0∏ -	00.0∏
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	a_Fakessyst	р с Н -	0.00	00.01	n	100.0H	00.0∏	nn.n∏	10.00	00.0 1 −	0.0 H -	00.0H	00.0H
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	7_shape_mcstat_W Z_JA_00S_DUIG_DII_0		00.01	00.00 H -	00.04	00-04-	00.0H	00.0H	00.0H	00.0H		00.0H-	00.0H
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- <i>ttW</i> + <i>ttZ</i> + <i>ttW W</i> - <i>ZK</i> -00s- <i>L</i> U			0.00 1	00.0∏	00.0∏ +	00.0 1 1 1 0 0 0 0 1 1 0 0 0 0 1	00.0 1 1 1 0 0	10.00	00.0		00.01 ₩	00.0 1 1 1 0 0 0 1
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Tehene metet 7 VD and DDTC him 0	11											
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		11											
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	γ-snape_mestat_ <i>UTC_TLC_DN_C_DN_C_DN_C_DN_C</i>	H H			00.0H	00.01	00.01 H 1	00.0H	10.00		8.0 H H	00.0H	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	vehane mestat ZZ SR obs RDTC him 0	1+	0.00						+0.00		8.0		00.04
		1+							00.01		8.0		000+
) C +	 -0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
	\sim share most at $W + V R$ obs BDTG him 0	1+	-0.00		+0.00	00.0+	+0.00	000+	+0.00	10.00	000+	00.0+	000+
	× share mostat Fakes VR obs BDTC hin 0	1+				000+	10.00		00.04	000+	000+		000+

Table 11: Breakdown of the dominant systematic uncertainties on background estimates in CR_6^{DF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Total background expectation498.66Total background error ± 27.62 Total background error ± 27.62 mu.tfDF ± 116.96 mu.tfDF ± 116.96 mu.tfDF ± 116.33 a.systtfXsec ± 33.39 a.systtfXsec ± 33.39 a.stfdEenerator ± 33.39 a.ffGenerator ± 17.18 c.ffCenerator ± 17.18 c.ffCenerator ± 116.58 a.tfGenerator ± 116.58 a.tfGenerator ± 116.58 a.tfgenerator ± 116.58 a.tfgenerator ± 116.38 a.tfgenerator $\pm $	99	5 29.58		27.18	0.04	1.92	2.79	0.00	0	430.48	0.00
	00			110 71			-	10.01	0	1	
	70	$\pm 0.05 \pm 7.81$	± 0.20	±10.71	±0.03	± 0.61	± 0.69	±0.00	±8.47	±32.27	±0.00
	.6.96 ±0.00	00 ±0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	± 116.96	土0.00
		++ -		±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	± 102.92	±0.00
		H -	00.0∏ +	10.00	± 0.00	±0.00	±0.00	00.0 1 1	00.0 1 1 0 0 1 0 1 0 0 1	± 43.13	00.01 1
							01.01		0000 H	17.17T	
		H -		00.0H	00.0 H		00.0H	00.0H	00-0 H	10.10H	
	7.1.5 ±0.00	00 ±0.00		00.0H		00.0H	±0.00 +0.03	00.0H	00.0H	H1/.13	
		++					80.04	0000+	2 2 8 1 8 1 8 1		000+
		+ +		±0.01 +10.37		00.04				-00 0+	00.04
	0.01 ±0.00			+0.001		00.04	+0.00	00.04	17		00.04
Jet energy resolution Is a character of the DDTC him O		00 H 00		77.0H						На. 10 01	
				110.00	00.0 H +	00.01 H 0.01	10.00		00.0H	0.0 H H	
	10.01 ±0.00	11 ±0.40	10.01 1	0000-	± 0.00	CU.U∄	10.01	00.0 1 1	00.0 1 −	16.11	00.0∏
				00.0H	00.0 H -	00.01 H	10.00	00.0H-	40.04 H -	00.0H	00.0H
	000 H0.00		00.0H	00.0H	00.0 H -	00.0H	-0000	00.0H	00.0H	00.0H	00.0H
				±0.03	± 0.00	±0.01	±0.00	±0.00	GU.U 1 1	±2.44	±0.00
				± 0.44	±0.00	± 0.28	±0.08	±0.00	± 0.41	± 3.76	±0.00
pe_mcstat_Wt_CR_obs_BD'IG_bin_0				±0.00	±0.00	±0.00	±0.00	#0.00	±0.00	±0.00	±0.00
	90 ±0.00	JU ±0.82		± 0.76	± 0.00	± 0.05	±0.08	±0.00	± 0.17	±0.00	±0.00
				± 1.35	±0.00	± 0.00	± 0.00	±0.00	#0.00	±0.00	±0.00
:at_WW_CR_obs_BDTG_bin_0				± 0.92	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00
	1.89 ± 0.00	00 ± 0.00		± 0.00	±0.00	±0.00	± 0.00	±0.00	± 0.89	±0.00	±0.00
				±0.00	±0.00	±0.00	± 0.61	±0.00	±0.00	± 0.00	±0.00
$Z_CR_obs_BDTG_bin_0$	37 ± 0.00	00 + 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.37	±0.00	±0.00
				± 0.00	±0.00	± 0.36	± 0.00	±0.00	#0.00	±0.00	±0.00
	± 0.30 ± 0.00			±0.00	±0.00	± 0.30	±0.00	±0.00	±0.00	±0.00	±0.00
$_{ttW} + ttZ + ttW W _ CK_{obs}BD'I'G_{bin}0$				±0.00	±0.00	±0.00	± 0.15	±0.00	±0.00	±0.00	±0.00
		00.0∓ 00		±0.00	± 0.00	±0.13	±0.00	±0.00	00.0∏	±0.00	±0.00
at_n_C.K_ods_B.U.I.G_din_U				±0.00	± 0.00	±0.00	±0.00	±0.00	00.0 1 1	±0.00	±0.00
α -system			00.0∏ -	00.0∏	± 0.00	00.0∏	±0.00	±0.00	00.0 1 1	00.0∏ -	00.01 −
	TU.U2 TU.U0									00.0H	
	10.0T 10.0T									00.04	
+ Eaber CR ake RDTC kin 0									800+		
	+0.00 +0.00			0000+	+0.00	+0.00	+0.00	+0.00	0000+	0000+	+0.00
				0000+	+0.00	00.01	+0.00	+0.00	0000+	00.0+	+0.00
	+0.00 +0.00	00.0+	0000+	0000+	+0.00	00.01+	+0.00	+0.00	000+	00.0+	+0.00
ohs BDTG hin 0				000+	000+	000+	+0.00	+0.00	000+	000+	000+
						000+	00.0+	000+	800+	000++	000+
	+0.00 +0.00			000+		000+	00.0+	+0.00	800+	000+	000+
				0000+	+0.00	00.04	+0.00	+0.00	0000+	00.0+	+0.00
		00 + 0.00		+0.00	+0.00	+0.00	+0,00	+0.00	+0.00	+0.00	+0.00
0				± 0.00	± 0.00	土0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00
	$+0.00 \pm 0.00$			± 0.00	± 0.00	± 0.00	± 0.00	+0.00	± 0.00	± 0.00	± 0.00
				0000+	+0.00	+0.00	+0.00	+0.00	0000+	0000+	+0.00
0	+0.00 + 0.00	00.01	+0.00	+0.00	+0.00	+0.00	+0,00	+0.00	+0.00	+0.00	+0.00
				+0.00	+0.00	+0.00	+0,00	+0.00	+0.00	+0.00	+0.00
at WZ SB obs BDTG bin 0	+0.00 +0.00			000+	000+	000+	000+	000+		000+	000+
hs BDTG hin 0				000+	+0.00	+0.00	+0.00	+0.00	0000+	000+	+0.00
	+0.00 +0.00	++		0001	+0.00	+0.00	+0.00	+0.00	0000+	00.0+	+0.00
		+		+0.00	± 0.00	± 0.00	+0.00	± 0.00	± 0.00	+0.00	± 0.00
0		+		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
		H		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00
		H		± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
0		++		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
		++		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00
		H		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
0-r	±0.00 ±0.00	D0 ±0.00		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00

Table 12: Breakdown of the dominant systematic uncertainties on background estimates in CR_6^{DF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	Total background expectation	7448.16		282.63	4.11 +0.40	14.81	2.96	4.69	25.42	4.29	70.17	5659.02	1377.87
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$					+0.40	0000							
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Total background error	± 724.55	ci i	± 61.50	0F-0H	±28.90	± 3.65	± 5.14	土5.73	± 1.60	±42.27	± 694.10	± 131.95
Bits Statistic Statist Statistic Stati		16600	0001	10.00	000+	00.01	00.04	000+	00 01	000+	00.04	TERE DO	00.0+
$ \begin{tabular}{l l l l l l l l l l l l l l l l l l l $	Jet energy scale	± 385.76	±0.08	± 18.05	±0.03	土0.02	±0.09	± 0.22	土0.77	± 0.26	± 1.86	± 363.53	±0.00
$\label{eq:logical constraints} \begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	$lpha_t t \overline{t} ISRFSR$	± 126.66	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 126.66	± 0.00
$ \begin{tabular}{l l l l l l l l l l l l l l l l l l l $	γ -shape_mcstat_ $Fakes_CR_obs_BDTG_bin_0$	± 126.07	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	± 126.07
$ \begin{array}{c} \mbox{plar} plar$	CellOut energy scale α syst W t Xsec	Н00.40 +56.53	80.0H H +	± 56.53	01.01 +0.00	0.00 +0.00	10.07 +0.00	80.01 +0.00	00.01 +0.00	60.0 10.0 10.0	00.01 00.01	H /0./4 +0.00	00.0 H + 0.0
$ \begin{array}{c} \mathbf{p} \\ \mathbf$	$\alpha_{-t\bar{t}GenPlusPS}$	± 54.39	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	± 54.39	土0.00
$ \begin{array}{c} \begin{tabular}{lllllllllllllllllllllllllllllllllll$	Lumi	± 50.10	± 0.06	± 7.91	± 0.12	± 0.41	± 0.08	± 0.13	± 0.71	± 0.12	± 1.96	± 0.00	± 38.58
$ \label{eq:relation} \begin{tabular}{lllllllllllllllllllllllllllllllllll$	$\alpha_{-J}VF$	± 49.87	± 0.01	± 5.21	± 0.03	± 0.15	± 0.06	± 0.08	± 0.06	± 0.00	± 0.48	± 43.79	± 0.00
$ \label{eq:product} \mbox{TGA} \mbox{TCA} \mbox{TGA} \mbox{TCA} $	α-PileUp	± 46.63	±0.00	± 5.56	±0.00	± 0.25	± 0.01	± 0.03	± 0.32	± 0.43	± 0.49	± 41.44	±0.00
$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$	α_ZGenerator Λ WWGenerator	± 40.48 ± 28.86	00.0 1 1 0 0 0	00.01 +0.00	00.0 +0.00	±0.00 +28.86	00.0 #+	0.0 # #	00.01 +	00.01 +0.00	± 40.48	±0.00 +0.00	00.0 ₩
$ \begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	γ -shape-mcstat- $t\bar{t}$ - CR -obs-BDTG-bin-0	± 26.80	±0.00	±0.00	±0.00	十0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 26.80	±0.00
$ \begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	γ -shape-mcstat- Wt - CR -obs-BDTG-bin-0	± 11.06	± 0.00	± 11.06	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	α -systZXsec	± 10.52	土0.00	±0.00	土0.00	土0.00	土0.00	±0.00	±0.00	±0.00	± 10.52	±0.00	±0.00
	Jet energy resolution	± 9.16	± 0.01	± 2.18	± 0.12	± 0.61	± 0.18	± 0.27	± 0.42	±0.08	± 4.22	± 7.73	±0.00
	CellOut energy resolution	Н8.08 Н 70	±0.03	±0.80	±0.04	10.01 +	±0.04	£0.08	±0.13 ±5.50	10.10 +	±0.40	19.30 +	0.0 ₩
	α -system processor α -FakesSvst	+5.41	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+5.41
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	α -WZGenerator	± 5.09	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 5.09	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\alpha_Z Z Generator$	± 3.64	± 0.00	± 0.00	± 0.00	± 0.00	± 3.64	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape_mcstat_Z_CR_obs_BDTG_bin_0	± 2.31	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 2.31	±0.00	±0.00
	$lpha$ -systt Δ Asec \sim share mostat DV CR ohs RDTC hin D	±2.19 +1.50	17.19 + 0.00	00.0# +0	00.0#	00.0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	00.0 ₩	00.0 ₩	00.01 +0.00	±0.00	00.0# +	00.00 +	00.0 1 1 1 0
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mestat-WW-CR-obs-BDTG-bin-0	±0.79	±0.00	±0.00	±0.00	±0.79	±0.00	±0.00	+0.00 +	+ 0.00 = 0.00	±0.00	±0.00	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\alpha_{\rm syst}WWX$ sec	± 0.74	± 0.00	± 0.00	± 0.00	± 0.74	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$	$mu_t\bar{t}SF$	± 0.57	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	±0.00	± 0.00	土0.00	± 0.57	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ_shape_mostat_W Z_CR_obs_BDTG_bin_0	± 0.52	++0.00	±0.00	±0.00	+0.00	+0.00 +	± 0.52	±0.00	+0.00	±0.00	+0.00 ++	0.00 + +
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	d-sno-	± 0.35	00.0 H +	00.01 +0.00	± 0.35	00.00 + 0.00	00.01 +0.00	00.0H	±0.40 +0.00	00.00 + 0.00	00.01 +0.00	00.00 +	00.01 +0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	α -systWZXsec	± 0.33	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.33	±0.00	±0.00	±0.00	±0.00	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat-ZZ-CR-obs-BDTG-bin-0	± 0.21	± 0.00	± 0.00	± 0.00	± 0.00	± 0.21	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ BDTG.bin.0 \qquad \pm 0.11 \qquad \pm 0.11 \qquad \pm 0.10 \qquad \pm 0.00 \qquad \pm 0.0$	α -systZXsec	± 0.15	土0.00	土0.00	土0.00	土0.00	± 0.15	±0.00	±0.00	±0.00	十0.00	±0.00	±0.00
$ \begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	γ -shape-mestat_ $tZCR$ obs_BD'I'G_bin_0	±0.11	±0.11	+0.00	#0.00	±0.00	+0.00	10.00 10.00	+0.00 +	±0.00	±0.00	±0.00	0.00 ++0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ shape mostat $WZ.SR$ obs. BDTG. bin.0	+0.00	00.00 + 0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$	γ -shape-mcstat- DY - VR -obs-BDTG-bin-0	±0.00	±0.00	土0.00	±0.00	±0.00	土0.00	土0.00	±0.00	土0.00	±0.00	±0.00	±0.00
$ \begin{tabular}{lllllllllllllllllllllllllllllllllll$		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW - VR_{obs}BDTG_{bin_0}$	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ-shape-mestat-DY-SK-obs-BDTG-bin-0	00.0∏ +0	00.0 1 1 1 1 1 1 1	00.0∏ +0	00.0 <u>+</u>	10.00	00.0 1 1 0 0 0 0 1	00.0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	10.00 10.00	00.01 +	00.0 1 1 1 0 0	10.00	00.0 H H
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ shape mostat Z V R obs BDTG bin 0	+0.00	00.00 + 0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+ 0.00	+0.00	+0.00	00.0 + 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat_ $t\bar{t}$ - SR -obs-BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- tZ_VR -obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape_mcstat_Z_SR_obs_BDTG_bin_0	±0.00	土0.00	±0.00	土0.00	土0.00	±0.00	±0.00	±0.00	±0.00	十0.00	±0.00	±0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- $Wt_VR_obs_BDTG_{bin_0}$	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	+0.00	±0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	γ-snape-mestat- <i>r akes-V</i> n_obs-bD I G-bin_U	00.01 +0.00	00.0 ₩ +	10.00 1	00.0 1 1	00.01 ₩	00.0∏	00.0 1 1 0	10.00 1	00.0 1 1 0	00.0 1 1 1	10.00 1	00.0 ₩
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	γ-suape-mestat-π.c.n.obs_DUIG-DUILO ~ chana meetat W/W/SR che RDTC hin D	00.0H	8 0 H +	00.0H	00.0H	00 0 H	00.0H		00.0H	00.0 H H		0.01 +	00.0 H +
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	\sim shape mostat Wt SR obs BDTG bin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mestat_ $Fakes_SR_obs_BDTG_{bin_0}$	±0.00	±0.00	+0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	+0.00	±0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- <i>H</i> - <i>VR</i> -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- $t\bar{t}$ - VR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
	γ -shape-mcstat- WW_VA -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
	γ -shape-mcstat-ZZZK-obs-BDTG bin-0 \sim shape mostat WZ VR obs BDTG bin 0	00.01 +0.00	00.0 1 1 0 0 0	00.01 +0.00	00.0 +	00.01 +	00.0 +	00.0 # 000	00.01 +0.00	00.01 +0.00	00.0# +0.00	±0.00 +0.00	00.0 +

Table 13: Breakdown of the dominant systematic uncertainties on background estimates in CR_1^{SF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		$\begin{array}{c c} 4.69 \\ \hline 4.69 \\ \hline 4.69 \\ \hline 5.11 \\ \hline 5.11 \\ \hline 5.11 \\ \hline 4.000 \\ \hline 5.11 \\ \hline 5.11 \\ \hline 6.00 \\ \hline 5.000 $	$\begin{array}{c} 25.42\\ 25.42\\ \pm 5.70\\ \pm 5.70\\ \pm 5.70\\ \pm 0.00\\ \pm$			$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
± 76.35 ± 2.19 ± 61.02 ± 0.40 ± 20.41 ± 3.63 ± 353.40 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 339.101 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 339.101 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 125.28 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 490.01 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 490.26 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 497.78 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 497.78 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 497.78 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 497.78 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 497.78 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 37.78 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 37.78 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 37.78 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 37.78 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 37.78 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 37.78 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 37.78 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 37.78 ± 0.00 ± 0.00 ± 0.00 ± 0.00 <tr< td=""><td>$\begin{array}{c} \pm 61.02 \\ \pm 0.00 \\ \pm 17.89 \\ \pm 0.00 \\ \pm 17.88 \\ \pm 26.07 \\ \pm 26.07 \\ \pm 26.00 \\ \pm 20.00 \\ \pm$</td><td></td><td>$\begin{array}{c c} \pm 5.11 \\ \pm 5.11 \\ \pm 0.00 \\ \pm 0$</td><td>±5.70 ±5.70 ±5.70 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±</td><td></td><td></td><td>$\begin{array}{c c} \pm 131.13 \\ \pm 131.13 \\ \pm 0.00 \\$</td></tr<>	$\begin{array}{c} \pm 61.02 \\ \pm 0.00 \\ \pm 17.89 \\ \pm 0.00 \\ \pm 17.88 \\ \pm 26.07 \\ \pm 26.07 \\ \pm 26.00 \\ \pm 20.00 \\ \pm$		$\begin{array}{c c} \pm 5.11 \\ \pm 5.11 \\ \pm 0.00 \\ \pm 0$	±5.70 ±5.70 ±5.70 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±10.00 ±			$\begin{array}{c c} \pm 131.13 \\ \pm 131.13 \\ \pm 0.00 \\$
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	± 0.00 ± 17.89 ± 10.00 ± 20.00 ± 23.61 ± 5.07 ± 5.07 ± 5.17 ± 5.00 ± 10.00 ± 11.00 ± 11.00 ± 2.16 ± 2.16 ± 2.16 ± 2.16 ± 2.16 ± 2.00 ± 2		$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	++++++++++++++++++++++++++++++++++++++			$\begin{array}{c} \pm 0.00 \\ \pm 125.28 \\ \pm 125.28 \\ \pm 0.00 \\ \pm 38.40 \\ \pm 0.00 \\ $
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	± 0.00 ± 17.89 ± 25.00 ± 25.00 ± 25.01 ± 25.17 ± 25.17 ± 25.17 ± 25.17 ± 25.17 ± 25.17 ± 25.17 ± 25.17 ± 25.17 ± 25.10 ± 25.10 ± 25.10 ± 25.10 ± 25.10 ± 25.00 $\pm 25.$		$\pm \pm 0.00$ ± 0.0	1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000			$\begin{array}{c} \pm 0.00 \\ \pm 125.28 \\ \pm 125.28 \\ \pm 0.00 \\ \pm 125.28 \\ \pm 0.00 \\$
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\pm 1.7.89$ ± 0.00 ± 2.16 ± 3.61 ± 3.61 ± 7.88 ± 7.88 ± 7.17 ± 5.17 ± 5.17 ± 5.17 ± 2.16 ± 10.00 ± 10.00		$\begin{array}{c} + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\ + 1 \\$	++++++++++++++++++++++++++++++++++++++			$\begin{array}{c} \pm 1.25,28\\ \pm 1.25,28\\ \pm 0.00\\ \pm 20,00\\ \pm $
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	± 0.00 $\pm 3.6.07$ $\pm 3.6.07$ ± 7.88 ± 0.00 ± 7.88 ± 7.88 ± 0.00 ± 0.00		$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±0.00 ±±0.00 ±0.00 ±±0.00 ±0.00 ±±0.000 ±±0.000 ±±0.000 ±±0.000 ±±0.000 ±±0.000 ±±0.000 ±±0.000 ±±0.000 ±±0.000 ±±0.00000000			± 125.28 ± 0.00 ± 125.28 ± 0.00 ± 23.40 ± 0.00 ± 20.00 ± 20.00
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$\begin{array}{cccccccccccccccccccccccccccccccccccc$	± 5.53 ± 0.00 ± 11.00 ± 11.00 ± 20.00 ± 20.0		$\begin{array}{c} \pm 0.03 \\ \pm 0.00 \\ \pm 0.0$	±±0.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.00 +±10.000 +±10.00 +±10.000 +±10.000 +±10.000 +±10.000 +±10.000 +			$\begin{array}{c}\pm 0.00\\\pm 0.00\pm 0.00\\\pm 0.00\pm 0.$
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Table 14: Breakdown of the dominant systematic uncertainties on background estimates in CR_1^{SF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Uncertainty of channel	CR_2^{SF}	tZ	Wt	Η	MM	ZZ	ZM	$t\bar{t}W+t\bar{t}Z+t\bar{t}WW$	DY	N	$t\overline{t}$	Fakes
Total background expectation	7456.86	2.20	280.85	4.10	14.74	2.96	4.68	25.42	4.27	68.86	5661.14	1387.64
Total background error	±723.67	± 2.19	±60.83	土0.41	±28.91	土3.67	± 5.17	±5.73	± 1.56	土40.98	± 693.95	± 132.40
$a_{systf} Xsec \\ a_{systf} Xsec \\ a_{shape} mestat_Fakes_CR_obs_BDTG_bin_0 \\ a_{thergy} scale \\ a_{thergy}$	$\begin{array}{c} \pm 566.11\\ \pm 566.11\\ \pm 127.89\\ \pm 127.85\\ \pm 83.68\\ \pm 83.68\\ \pm 83.68\\ \pm 450.17\\ \pm 56.17\\ \pm 450.04\\ \pm 450.04\\ \pm 11.41\\ \pm 11.141\\ \pm 11.1.41\\ \pm 11.1.41\\ \pm 11.1.33\\ \pm 11.0.33\\ \pm 1.0.33\\ \pm 2.26\\ \pm 2.$	+++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 +++++0.00 ++++++0.00 ++++++0.00 ++++++++++++++++++++++++++++++++++++	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00	$\begin{array}{c} \pm \pm 0.00\\ \pm 0.00\\ \pm \pm 0.00\\ \pm 0$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	+++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 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10	$\begin{array}{c} + \pm \pm 0.00\\ \pm 0$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	$\begin{array}{c} \pm 566.11\\ \pm 566.11\\ \pm 127.89\\ \pm 60.00\\ \pm 10.00\\ \pm 0.00\\ \pm 0.00\\$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$
γ -shape-mestat. DY - K - to W - tX - DOS -DD1G-DD1 γ - shape-mestat. DY - SR - obs. BDTG - bin. 0 γ - shape-mestat. ZV R-obs. BDTG - bin. 0 γ - shape-mestat. ZSR - obs. BDTG - bin. 0 γ - shape-mestat. ZSR - obs. BDTG - bin. 0 γ - shape-mestat. ZSR - obs. BDTG - bin. 0 γ - shape-mestat. ZSR - obs. BDTG - bin. 0 γ - shape-mestat. RSR - obs. BDTG - bin. 0 γ - shape-mestat. RR - obs. BDTG - bin. 0 γ - shape-mestat. RR - obs. BDTG - bin. 0 γ - shape-mestat. RR - obs. BDTG - bin. 0 γ - shape-mestat. RR - obs. BDTG - bin. 0 γ - shape-mestat. RVR - RR - obs. BDTG - bin. 0 γ - shape-mestat. RVR - RR - obs. BDTG - bin. 0 γ - shape-mestat. RVR - RR - obs. BDTG - bin. 0 γ - shape-mestat. RVR - RR - obs. BDTG - bin. 0 γ - shape-mestat. RVR - RR - obs. BDTG - bin. 0 γ - shape-mestat. RVR - RR - obs. BDTG - bin. 0 γ - shape-mestat. RVR - RR - obs. BDTG - bin. 0 γ - shape-mestat. RVR - RR - obs. BDTG - bin. 0 γ - shape-mestat. RVR - RR - obs. BDTG - bin. 0 γ - shape-mestat. RVR - RR - obs. BDTG - bin. 0 γ - shape-mestat. RVR - RR - obs. BDTG - bin. 0 γ - shape-mestat. RVR - RR - obs. BDTG - bin. 0 γ - shape-mestat. RVR - RR -	$\begin{array}{c} \pm \\ \pm \\ \pm \\ 0.000 \\ \pm \\ 0.000 \\ \pm \\ 0.000 \\ \pm \\ \pm \\ 0.0$	## # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # #	$\begin{array}{c} \begin{array}{c} \pm 0.00\\ \pm $	$\begin{array}{c} \begin{array}{c} & \pm \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ $	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2000 2000 2000 2000 2000 2000 2000 200	2000 2000 2000 2000 2000 2000 2000 200	7000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000 1000	1000 1000 1000 1000 1000 1000 1000 100	$\begin{array}{c} \begin{array}{c} & \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ & $	$\begin{array}{c} \pm 1000\\ \pm 1000$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$

Table 15: Breakdown of the dominant systematic uncertainties on background estimates in CR_2^{SF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Uncertainty of channel	CR_2^{21}	t Z	2 11	1		1	1	$M M \eta + \tau \eta + M \eta \eta$	1	3	2.2	T UNCO
Total background expectation	5747.37	2.20	280.84	4.10	14.71	2.96	4.68	25.42	4.26	68.86	3951.70	1387.64
Total background error	土76.28	± 2.18	±60.36	土0.41	土28.82	土3.64	± 5.13	± 5.69	± 1.56	±40.72	± 176.00	± 131.57
mu_ttSF	± 529.68	+ + 0.00 + +	+0.00 +	±0.00	+0.00	00.00 + + 0.00	00.00 + + 0.00	10.00 10.00	+0.00 +	±0.00	± 529.68	00.00 # +
arsystutased Jet energy scale	+271.27	00.0 +0.08	± 0.00 ± 16.68	± 0.03	+0.89	+0.09	± 0.00 + 0.21	±0.00 +0.73	± 0.26	± 0.00 +1.90	± 250.67	00.00+
γ -shape_mcstat_ $Fakes_CR_obs_BDTG_bin_0$	± 125.66	+0.00	±0.00	±0.00	±0.00	±0.00	+0.00	±0.00	+0.00	±0.00	±0.00	± 125.66
$\alpha_{-t\bar{t}ISRFSR}$	± 90.25	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 90.25	± 0.00
CellOut energy scale	± 60.19	± 0.03	± 3.73	± 0.10	± 0.08	± 0.02	± 0.09	± 0.15	± 0.05	± 2.71	± 53.23	± 0.00
α -systWtXsec	± 55.73	±0.00	± 55.73	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
Lumi	± 50.04	± 0.06	± 7.83	± 0.11	± 0.41	±0.08	± 0.13	± 0.71	± 0.12	± 1.92	±0.00	± 38.67
α_ttGenFlusFS	± 41.01	00.01 1	00.0∏	00.0±	10.00	00.0∏	00.0 1 1 0	00.01 + +	00.01 + 0.00	±0.00	±41.01	00.01 +0.00
α_denerator 2 TVF	1900.91 196.90	8 6 H H	14 00 H		00.01 H H	00.0H		DO OF		19.00H	1.00 97	
α-JVF Ω PileIIn	12.061 +33.40	10.0 H +	Н4.99 +5 11	50.0H	01.01 10.05	0.01 10 10	90.0 H H	00.0H H - 30	H 0.00	H0.44	H 30.37	0.0
all NUC Generator	+28.77	0000+	+0.00	10.01	+ 28.77	+0.00	000+	800 1+	+0.00	10.00	0000+	00.0+
γ -shape-mcstat_tt_CR_obs_BDTG_bin_0	± 18.60	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 18.60	±0.00
γ -shape-mcstat- Wt - CR -obs-BDTG-bin-0	± 10.96	± 0.00	± 10.96	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
α _systZXsec	± 10.26	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 10.26	± 0.00	± 0.00
Jet energy resolution	± 8.01	± 0.01	± 3.24	± 0.13	± 0.58	± 0.17	± 0.27	± 0.39	土0.08	± 4.14	± 7.70	±0.00
α-syst I plus Asec	±0.00 +г од	00.01 1	00.0∏	±0.00	10.00 1	00.0 1 1 1 0 0 0 1	00.0	- H	00.01 +	00.0 1 1	00.00 +	±0.00
arransust CollOnt anonar meedintion	Н0.07 Н 2	80.0 H H	1 64		00.0H			00.0H		H0.01	10.00 16.97	10.01 H
$\sim WZGenerator$	+5.08	+0.00+	+0.00+	+0.00+	+0.00	+0.00 +	+5.08	*••••+	+0.00	10.01	10.0+	00.0+
$\alpha_z Z Generator$	+3.63	+0.00	+0.00	+0.00	+0.00	+3.63	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat-Z-CR_obs-BDTG-bin-0	± 2.25	± 0.00	土0.00	土0.00	土0.00	土0.00	土0.00	±0.00	±0.00	± 2.25	±0.00	±0.00
α -systtZXsec	± 2.18	± 2.18	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- DY - CR -obs-BDTG-bin-0	± 1.50	± 0.00	土0.00	土0.00	土0.00	土0.00	土0.00	±0.00	± 1.50	土0.00	± 0.00	土0.00
γ -shape-mcstat- WW - CR -obs-BDTG-bin-0	± 0.78	±0.00	±0.00	±0.00	± 0.78	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
α -syst W X sec	±0.73	00.0 1 1 0	±0.00	±0.00	±0.73	±0.00	±0.00	100.00 +	00.00 +	00.0±	00.00 +	00.0 1 1 1 0 0 0 1 1 0 0 0 1
γ shape mostat $t\bar{t}W + t\bar{t}Z + t\bar{t}WW CR$ obs BDTG hin 0	+0.45	00.0+	00.01 +0.00	00.01	0.00	0000 +0.00	70.00+	± 0.00	0.00	00.01		00.04
	± 0.35	± 0.00	± 0.00	± 0.35	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
α -syst WZ Xsec	± 0.33	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.33	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_ZZ_CR_obs_BDTG_bin_0	± 0.21	±0.00	±0.00	±0.00	±0.00	± 0.21	±0.00	±0.00	±0.00	±0.00	+0.00	±0.00
α_systZZAsec	±0.15	0.01 10.01	00.0∏ +	00.0 1 1 1 0 0	00.00 + +	00 0 1 0 0 1 0 0 1 0	00.0 1 1 1 0 0 1	10.00 10.00	10.00 1 ± 0.00	00.0 1 1 1 0 0	00.00 + +	00.01 1
\sim shape mostat ZZ VR obs BDTG bin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
$\gamma_{\text{-shape-mcstat}} t \bar{t} W + t \bar{t} Z + t \bar{t} W W_{-S} R_{\text{-}} \text{obs}_{-B} D T G_{-\text{bin}} - 0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- WZ - SR -obs- $BDTG$ -bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $DY_VR_obs_BDTG_bin_0$	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -snape_mostat_ $tw + tt z + tt W W - V R_{0}$ obs. BUT G_DIN_U	00.0∏	00.0 ₩	00.0∏	00.04	00.0 1 1 1	00.0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	00.0 ∏ +		00.0 	00.0#	00.01 +	00.01 1
γ shape mostat Z VR obs BDTG bin 0	+0.00	0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	
γ -shape-mestat_ $t\overline{t}$ - SR_{obs} -BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	+0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- tZ_VR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-Z-SR-obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $Wt_VR_obs_BDTG_bin_0$	± 0.00	± 0.00	土0.00	± 0.00	土0.00	土0.00	土0.00	土0.00	± 0.00	土0.00	土0.00	± 0.00
γ -shape-mcstat_Fakes_VR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	土0.00	±0.00	±0.00	十0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- $WW_SR_obs_BDTG_{bin_0}$	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- $W t_{-S} R$ -obs- $BDTG$ -bin-0	±0.00	00.0 ₩	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	± 0.00	#0.00	±0.00	±0.00
γ-snape-mestat- <i>H</i> -5 <i>K</i> -008-BD1G-D1-0 « share mestat <i>Fickes</i> SR obs RDTC him 0	00.0 +0 00 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	00.0 1 1 0	00.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	00.0#	00.0 +	00.0#	00.0 ₩	00.01 00.01	00.0 +	00.0#	000 +	00.0 1 1
\sim share most at $H V R$ obs RDTG bin 0	00.0+	0000+	+0.00	00.0+	+0.00	000+	00.0+	8004+	0000+	+0.00	000+	00.0+
γ -shape-mestat_ $t\bar{t}$ - VR -obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	+0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $WW_VR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-ZZ-SR-obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_ $WZ_VR_obs_BDTG_bin_0$	± 0.00	± 0.00	+0.00				- UU			000		

Table 16: Breakdown of the dominant systematic uncertainties on background estimates in CR_2^{SF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Total background expectation	7446.55	2.20	281.74	4.10	14.76	2.96	4.69	25.36	4.29	69.08	5659.54	1377.83
Total background error	± 723.55	± 2.20	± 61.15	土0.41	土28.87	± 3.65	± 5.03	± 5.72	± 1.60	± 41.23	± 693.59	± 131.95
α_systttXsec	± 565.95 ± 282.08	±0.00 +0.00	± 0.00 ± 17.20	±0.00	± 0.00	±0.00	±0.00	+0.00 +0.74	±0.00 +0.26	±0.00	± 565.95 ± 361.35	+0.00 +
$\alpha_{-t\bar{t}\bar{l}ISRFSR}$	± 127.59		土0.00	±0.00	±0.00	±0.00	十0.00	十0.00	十0.00	十0.00	± 127.59	±0.00
γ -shape-mcstat- $Fakes$ - CR -obs-BDTG-bin-0	± 126.07		± 0.00	±0.00	± 0.00	± 0.00	± 0.00	十0.00	± 0.00	± 0.00	± 0.00	± 126.07
CellOut energy scale	± 83.29	± 0.03	± 3.68	± 0.10	± 0.08	± 0.02	±0.09	± 0.13	± 0.05	± 2.68	± 76.42	±0.00
$\alpha_{-ttGenPlusPS}$	±59.58	0.00 + +	±56.00	+0.00 +	+0.00	00.00 + + 0.00	00.00 + +	10.00 10.00	+0.00 +	±0.00	± 59.58	00.00 1 + +
a_systwt.Asec Ti	H30.33	00.04	H20.33	00.0H	00.01 1	00.0H	00.0H	H0.00	00.0H	HU.UU	10000 1000 1000 1000	HU.U0 + 38.58
A UVF	+49.83		+5.21	+0.03	+0.15	+0.06	80.0+	+0.06	+0.00	+0.45	+43.78	00.00+
α-PileUp	+46.71	+0.00	+5.12	+0.01	+0.25	+0.01	+0.03	± 0.33	+0.43	+0.67	+42.13	+0.00
α -ZGenerator	± 39.39	± 0.00	土0.00	土0.00	土0.00	土0.00	土0.00	±0.00	土0.00	± 39.39	± 0.00	±0.00
αWW Generator	± 28.83	± 0.00	± 0.00	± 0.00	± 28.83	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $t\overline{t}$ - CR -obs-BDTG-bin-0	± 26.79	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 26.79	± 0.00
γ _shape_mcstat_ $Wt_CR_obs_BDTG_bin_0$	± 11.03	土0.00	± 11.03	土0.00	± 0.00	土0.00	土0.00	±0.00	± 0.00	十0.00	± 0.00	±0.00
α _systZXsec	± 10.36	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 10.36	±0.00	±0.00
CellOut energy resolution	±7.62	±0.03	±0.80	±0.04	±0.01	±0.04	#0.08	±0.14	±0.10	±0.65	12.7±	00.0 ₩-
Jet energy resolution	01:74 82.74	70.07 H H	00.0H	1000 100 100 100 100 100 100 100 100 10	00.0H	000 100 100 100 100 100	77.0H	Н 0.4-0 7 л 7 8 л 8	90.0 H +	T4.40	±0.94	0.00
$\alpha_{-F}akesSvst$	+5.40	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+5.40
αWZ Generator	± 4.97	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土4.97	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\alpha_Z Z Generator$	± 3.63	± 0.00	± 0.00	± 0.00	± 0.00	± 3.63	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_Z_CR_obs_BDTG_bin_0	± 2.27	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	±0.00	土0.00	± 2.27	土0.00	± 0.00
α -systtZXsec	± 2.19	± 2.19	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ_shape_mestat_DY_CK_obs_BDTG_bin_0	11.50 10.70	0.00 H H	10.00 1	00.0∏ +	10.00 10.70	00.0∏	00.0∏	10.00 1	11.50 1	00.0∏	00.00 +	00.00 ₩
v svstWWXsec	+0.74	00.0+	00.0+	00.01 +0.00	+0.74	0000+	00.0+	00.01+	0000+	00.0+	0000+	00.0+
$mu_t \bar{t}SF$	± 0.57	土0.00	土0.00	土0.00	十0.00	土0.00	土0.00	±0.00	土0.00	±0.00	± 0.57	±0.00
γ -shape_mcstat_WZ_CR_obs_BDTG_bin_0	± 0.52	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.52	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW$ _CR_obs_BDTG_bin_0	± 0.45	±0.00	土0.00	土0.00	±0.00	±0.00	土0.00	± 0.45	土0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- <i>H</i> - <i>CR</i> -obs-BDTG-bin-0	± 0.35	±0.00	±0.00	± 0.35	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	+0.00	±0.00
α -systw ZAsec	10.33 +0.33	0.00 H H	10.00 1	00.0∏ +	10.00	±0.00	±0.33	10.00 1	10.00	00.0∏	00.00 +	00.00 ₩ +
Y SHAPE-IIICSIAL-2 Z-C A-UDS-DD I G-DIII-U or svst Z Z X sec	± 0.15	000 H +	00.01 +	0000 +0.00	0.00	+0.15	00.01	-00.00 +0.00	0000 +	00.01		
γ -shape_mestat_ $tZ_CR_obs_BDTG_bin_0$	± 0.11	± 0.11	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	+0.00	+0.00
γ -shape_mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW_{-}SR_{-}obs_BDTG_{-}bin_{-}0$	土0.00	土0.00	± 0.00	土0.00	±0.00	±0.00	土0.00	±0.00	土0.00	± 0.00	±0.00	±0.00
γ _shape_mcstat_WZ_SR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ $DY_VR_{obs}BDTG_{bin_0}$	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- tZ_SK_{-} obs- BD G_{-} bin- 0	±0.00	0.00 	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	00.0 1 1 1 1 0 0 0 0
γ -sumpermission γ	00.04	8 0 H +		00.0H	00.0H	00.0H	00.0H		00.0H	00.0H	00.01 +	
γ -shape mostat ZZ_VR_{obs} BDTG-bin-0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat-Z-VR-obs-BDTG-bin-0	±0.00	土0.00	土0.00	土0.00	土0.00	土0.00	± 0.00	±0.00	土0.00	± 0.00	±0.00	±0.00
γ -shape-mcstat- $t\bar{t}$ - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ _shape_mcstat_ $tZ_VR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_Z_SR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	十0.00	±0.00	±0.00	±0.00	十0.00	±0.00	±0.00	±0.00	±0.00
γ -shape_mcstat_W t_V R_obs_BD'I'G_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mostat- <i>H</i> akes- <i>V H</i> -obs- <i>BU</i> I G-bin-0	±0.00	0.0 1 -	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	00.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
γ-snape-mestat- <i>H -DK</i> -ODS- <i>BU</i> I G-DIN-U	00.01 ₩	8 0 H H	00.04	00.01 1	00.0 1 1 1	00.0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	00.0 1 1 1 0 0		100.00	00.0 ∏ 1	00.01 +	00.0 H H
γ_shape_micstat_W W = Ω A_UDS_DD I G_DIII_U ~ shape mostat W + SR obs RDTG hin 0	00.04	8 0 H +		00.0H	00.0H	00.0H	00.0H		00.0H	00.0H	00.01 +	
γ shape mostat $Fakes SR$ obs BDTG bin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
γ -shape-mestat- H_VR_obs -BDTG-bin-0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat- $t\bar{t}$ - VR -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	土0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- $WW_VR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- ZZ - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- WZ - VR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	+0.00	00.0+	+0.00				

Table 17: Breakdown of the dominant systematic uncertainties on background estimates in CR_3^{SF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			$\begin{array}{c c} 4.69 \\ \hline 4.000 \\ \hline 6.00 \\ \hline 4.000 \\ \hline 6.00 \\ \hline$	$\begin{array}{c} 25.36\\ \pm 5.68\\ \pm 5.68\\ \pm 0.00\\ $			$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			+4.99 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90 +4.90	+5.68 + 10.00 + 10.00			$\begin{array}{c c} \pm 131.12 \\ \pm 0.00 \\ \pm$
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\ \pm 0.00\\ \pm 0.00\\ \pm 5.03\\ \pm 55.93\\ \pm 55.93\\ \pm 55.03\\ \pm 55.00\\ \pm 0.00\\ \pm 0$			$\begin{array}{c} \pm \pm 0.00\\ \pm 0$	+ + 0.00 + + 0.00 + -			$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} \pm 17.17\\ \pm 10.00\\ \pm 10.$			+	##0.00 ####0.00 ####0.00 ####0.00 ####0.00 ####0.00 ###0.00 ###0.00 ###0.00 ##0.00 ##0.00 ##0.00 ##0.00 ##0.00 ###0.00 ####0.00 #####0.00 #####0.00 ########			$\begin{array}{c} \pm 2.00 \\ \pm 1.252 \\ \pm 1.252 \\ \pm 0.00 \\ \pm 2.00 \\ \pm 0.00 \\ \pm 0$
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} \pm 1.7.17\\ \pm 0.00\\ \pm 25.93\\ \pm 25.93\\ \pm 25.93\\ \pm 25.00\\ \pm 25.$			+	++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.			$\begin{array}{c} \pm 1.25,28\\ \pm 1.25,28\\ \pm 0.00\\ \pm 2.00\\ \pm$
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} \pm 0.00\\ \pm 3.00\\ \pm 3.00\\ \pm 3.00\\ \pm 3.00\\ \pm 7.85\\ \pm 7.85\\ \pm 7.85\\ \pm 7.85\\ \pm 7.00\\ \pm 7.00\\ \pm 10.00\\ \pm 10.00$			$\begin{array}{c} \pm \pm 0.00\\ \pm$	++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00 +++0.00			$\begin{array}{c} \pm 1.25.28\\ \pm 0.00\\ \pm 0.$
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} \pm 20.00\\ \pm 53.06\\ \pm 55.35\\ \pm 7.85\\ \pm 7.85\\ \pm 7.85\\ \pm 7.85\\ \pm 20.00\\ $			±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00	++0.00 ++++0.00 ++++0.00 ++++0.00 +++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 ++++0.00 +++++0.00 +++++0.00 +++++0.00 +++++0.00 +++++0.00 +++++0.00 +++++0.00 +++++0.00 +++++0.00 ++++++0.00 +++++0.00 +++++0.00 +++++0.00 +++++0.00 ++++++++			+0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.0000 +0.00000 +0.0000 +0.0000000 +0.00000000
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	± 3.66 ± 5.33 $\pm 7.5.93$ $\pm 7.5.93$ $\pm 7.5.03$ ± 0.00 ± 5.17 ± 0.00 ± 0.000 ± 0.0000 ± 0.0000 ± 0.0000 ± 0.0000 ± 0.00000 ± 0.00000 $\pm 0.00000000000000000000000000000000000$			±±0.09 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 ±±0.00 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Table 18: Breakdown of the dominant systematic uncertainties on background estimates in CR_3^{SF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

$\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	Uncertainty of channel	CR_4^{SF}	tZ	Wt	Н	M M	ZZ	ZM	$t\bar{t}W + t\bar{t}Z + t\bar{t}WW$	DY	N	$t\overline{t}$	Fakes
	Total background expectation	3706.41	0.36	242.97	4.08	152.18	3.23	16.74	9.27	49.42	289.37	2938.79	0.00
	Total background error	土414.05	± 0.36	± 52.45	± 0.68	± 61.55	± 1.55	± 3.09	± 2.14	± 17.69	± 125.66	± 362.75	土0.00
TCL TCL <td></td>													
	α -syst $tt X$ sec	± 293.88 ± 120.62	00.00 1 + 0.00	+0.00	±0.00	+0.00	00.00 + 0.00	+0.00	±0.00	10.00	+ 0.00	± 293.88 ± 120.62	10.00
	or ttPartonShower	+117.55	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	00.04	+0.00	00.0++	+117.55	+0.00
	CellOut energy scale	± 113.49	土0.01	± 4.02	± 0.39	± 3.29	土0.07	± 0.59	± 0.03	± 5.95	± 52.23	± 46.96	土0.00
	α -trigger	± 111.19	± 0.01	± 7.29	± 0.12	± 4.57	± 0.10	± 0.50	± 0.28	± 1.48	± 8.68	± 88.16	± 0.00
	$\alpha_z ZGenerator$	± 79.30	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 79.30	± 0.00	± 0.00
	α JVF	± 64.18	±0.00	± 7.68	± 0.04	± 7.30	± 0.20	± 0.34	土0.01	± 1.13	± 22.98	± 24.51	±0.00
	a_PileUp	± 60.58	±0.00	± 0.16	± 0.15	± 0.71	±0.06	± 0.52	± 0.05	± 8.60	± 49.06	± 3.11	±0.00
	α_W W Generator 2. #Troprop	±58.20 ±53.85	00.04 + +	10.00	00.00 +	± 58.20	00.00 + +	+0.00	±0.00	00.00 + +	+ 0.00	±с.00 ±г.2 сг	10.00
	v svst W t X sec	+48.50	00.04	+48.59	0000+	0000+	8.0++	0000+	00.0+	00.04	00.0+	00.0+	000
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\alpha_{-syst} X Xsec$	± 43.41	±0.00	00.01 10.00	±0.00	±0.00	±0.00	±0.00	十0.00	±0.00	± 43.41	±0.00 ±	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	CellOut energy resolution	± 39.37	± 0.01	± 7.45	± 0.26	± 0.40	± 0.04	± 0.21	± 0.03	± 5.59	± 27.46	± 0.99	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Jet energy scale	± 35.40	± 0.04	± 4.47	± 0.18	± 6.37	± 0.10	± 0.04	± 0.10	± 6.96	± 16.17	± 23.40	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Lumi	± 21.49	± 0.01	± 6.80	± 0.11	± 4.26	±0.09	± 0.47	± 0.26	± 1.38	± 8.10	±0.00	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ-snape-mcstat_ <i>tt_C</i> κ_obs_BD I G_bIn_U Ist energy resolution	±19.30 +18.41	00.0#	±0.00 Н 7 7 7	±0.00	±0.00 +13 &5	00.0 1 10.00	± 0.00 + 1 13	±0.00 +0.43	10.01 40.68	±0.00 +33 35	±19.30 +5 86	00.0 1 1
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	\sim shape mostat Z <i>CR</i> obs BDTG hin 0	+15.93	+0.00	+0.00	+0.00	+0.00	00.04	00.0+	00.0+	+0.00	+15.93	00.0+	+0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- Wt - CR -obs-BDTG-bin-0	± 10.43	±0.00	± 10.43	± 0.00	土0.00	±0.00	± 0.00	土0.00	±0.00	± 0.00	±0.00	±0.00
	lpha-syst WW Sec	± 7.61	± 0.00	± 0.00	± 0.00	± 7.61	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- DY - CR -obs- $BDTG$ -bin-0	± 4.96	±0.00	±0.00	土0.00	±0.00	±0.00	±0.00	土0.00	± 4.96	±0.00	±0.00	±0.00
$ TG.bin.0 \qquad TG.00 \qquad TO.00 \qquad TO.00 \qquad TO.00 \qquad TO.00 \qquad TJ.01 \qquad $	γ_shape_mcstat_W W_CR_obs_BD'I'G_bin_0	± 2.55	00.00 + 0.00	±0.00	±0.00	± 2.55	±0.00	± 0.00	±0.00	10.00	±0.00	0.00 +	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	α_W ZGenerator α_svstTplusXsec	± 2.04	+0.00	±0.00	± 0.00	±0.00	00.01 +0.00	+0.00	± 2.04	+0.00	±0.00	00.00 + 0.00	±0.00
	$\alpha_z Z Z$ Generator	± 1.47	土0.00	土0.00	土0.00	土0.00	土1.47	土0.00	±0.00	土0.00	土0.00	±0.00	土0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	lpha-syst WZ Sec	± 1.17	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 1.17	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
	γ -shape_mcstat_WZ_CR_obs_BDTG_bin_0	± 0.94	±0.00	±0.00	± 0.00	±0.00	±0.00	± 0.94	± 0.00	±0.00	±0.00	±0.00	±0.00
$ TG.bin, \begin{array}{ccccccccccccccccccccccccccccccccccc$	γ_shape_mcstat_H_CK_obs_BDTG_bn_U	±0.39 +0.36	±0.00	±0.00	±0.39	±0.00	00.0 1 1 0 0 0 0 1	±0.00	±0.00 +0.00	00.0 1 1 0 0 0 0 1 1 0 0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 0 0 0 0 1 0 1 0 0 0 1 0 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	± 0.00	00.0 +	±0.00
TG.bin.0 10.38 1000 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 1	u_sysurzased mu_tfSF	± 0.20	+0.00	+0.00	+0.00	+0.00	0.00 +0.00	+0.00	+0.00	+0.00	+0.00	± 0.29	+0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW$ _ CR _obs_BDTG_bin_0	± 0.28	±0.00	土0.00	± 0.00	±0.00	土0.00	± 0.00	± 0.28	±0.00	± 0.00	±0.00	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ _shape_mcstat_ZZ_CR_obs_BDTG_bin_0	± 0.21	± 0.00	± 0.00	± 0.00	± 0.00	± 0.21	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ TG.bin.0 \qquad \pm 10.04 \qquad \pm 10.04 \qquad \pm 10.00 \qquad \pm 0.00 \qquad \pm 0.$	$\alpha_{\text{syst}}ZZX$ sec	± 0.16	±0.00	±0.00	± 0.00	±0.00	± 0.16	± 0.00	±0.00	±0.00	± 0.00	±0.00	±0.00
$ TG-bin_{,0} \begin{array}{ccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- tZ - CK -obs- $BDTG$ -bin-U \sim shape mestat $Fabes CR$ obs $BDTG$ bin D	±0.04	±0.04	00.0# +0	00.0 +	00.0 +	0.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	00.0 +	±0.00 +0.00	00.0 1 1 1 0 0 0 1 1 0 0 0 1 1 0 0 0 1 1 0 0 1 0 0 0 1 1 0 0 0 1 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	00.0 +	00.0#+	00.0 +
TG.hin. 0 100 100 100 100 100 100 100 100 100	γ -shape-mestat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW$ _SR-obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	十0.00	±0.00	±0.00	±0.00	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- $WZ_SR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ TG.bin.0 \qquad \pm 0.00 $	γ -shape-mcstat- $DY_VR_obs_BDTG_bin_0$	±0.00	土0.00	土0.00	±0.00	土0.00	±0.00	土0.00	十0.00	±0.00	土0.00	±0.00	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		00.04	10.00 1	#0.00	00.00 + +	±0.00	00.0∏	±0.00	±0.00	00.00 +	±0.00	00.0 1 1 1 0 0 0 0 1 0 0 0 0 0 1	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		00.01	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- $ZZ_VR_{obs}BDTG_{bin_0}$	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	± 0.00	±0.00	土0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ _shape_mcstat_Z_VR_obs_BDTG_bin_0	±0.00	土0.00	土0.00	± 0.00	土0.00	土0.00	土0.00	十0.00	土0.00	土0.00	十0.00	土0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	α -FakesSyst	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat-tt-LACobs-BUTG-Din-U \sim share metat +7 VR obs BDTC hin 0	00.0 1 1 1	00.0#	00.0∓	00.0 +	10.00 +	0.0 1 1	00.0 +	±0.00	00.0 1 1 1 0 0 0 1 1 0 0 0 1 1	10.00 +	00.0#+	00.0
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mestat-Z-SR obs-BDTG-bin-0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	00.0+	+0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mestat_W t_VR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	土 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- $Fakes-VR$ -obs-BDTG-bin-0	十0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	±0.00	土0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat-H-SR-obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- WW - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- Wt - SR -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	土0.00	土0.00	土0.00	± 0.00	±0.00	±0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- $Fakes$ - SR -obs-BDTG-bin-0	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- <i>H</i> - <i>V R</i> -obs-BDTG-bin-0	00.00 + +	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	十0.00 十	±0.00	±0.00	00.00 + +	+0.00 +
±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 <th< td=""><td>γ-snape-mostat_tt_V K_ODS_DULG_DILU \sim shana mostat IVIN V P ohs RDTC hin D</td><td>00.0H</td><td>00.0H</td><td>10.01</td><td></td><td>10.01 1</td><td>00.04</td><td>00.0 +</td><td>10.00</td><td>00.0 1 1</td><td>0000+</td><td>00.0H</td><td>00.0 +</td></th<>	γ -snape-mostat_tt_V K_ODS_DULG_DILU \sim shana mostat IVIN V P ohs RDTC hin D	00.0H	00.0H	10.01		10.01 1	00.04	00.0 +	10.00	00.0 1 1	0000+	00.0H	00.0 +
平0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00 ~0.00	γ -shape_mestat_ZZ_SR_obs_BDTG_bin_0	00.00 =	±0.00	±0.00	± 0.00	±0.00	00.01 +0.00	±0.00	±0.00	+0.00 +0.00	±0.00	00.00 00.00	±0.00
	γ -shape-mcstat-WZ-VR-obs-BDTG-bin-0	土0.00	土0.00	土0.00	± 0.00	土0.00	土0.00	土0.00	十0.00	± 0.00	土0.00	土0.00	土0.00

Table 19: Breakdown of the dominant systematic uncertainties on background estimates in CR_4^{SF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

	5.1.4	3	2 4 4			2	Z	ttW + ttZ + ttWW	Л	Ņ	11	Fakes
Total background expectation	4034.85	0.36	243.24	4.09	152.57	3.23	16.75	9.27	49.51	288.88	3266.96	0.00
Total background error	± 64.70	± 0.36	± 52.13	± 0.68	± 61.16	± 1.54	土3.07	± 2.13	± 17.59	± 124.78	± 176.21	±0.00
mu_{ttSF}	± 456.46	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 456.46	±0.00
α-systitAsec	±323.08 ±144.87		10.00 1	00.0 1 1	00.0 1 1 0 0 0 0 1 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	00.0 ₩	00.0		00.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0000+	±323.08 ±144.27	1000 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
or tt Parton Shower	+129.77		+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+129.77	+0.00
α_trigger	± 120.18		± 7.24	土0.12	± 4.54	土0.10	± 0.50	± 0.28	± 1.47	± 8.60	± 97.31	土0.00
CellOut energy scale	± 118.07		± 3.99	± 0.38	± 3.27	± 0.07	± 0.59	± 0.03	± 5.92	± 51.89	± 51.97	± 0.00
$\alpha ZGenerator$	± 78.73	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 78.73	± 0.00	± 0.00
$\alpha_{-}JVF$	± 66.46	± 0.00	± 7.64	± 0.04	± 7.25	± 0.20	± 0.34	± 0.01	± 1.12	± 22.82	± 27.06	± 0.00
α -PileUp	± 60.50	± 0.00	± 0.16	± 0.15	± 0.71	± 0.06	± 0.52	± 0.05	± 8.55	± 48.71	± 3.43	± 0.00
$\alpha W W$ Generator	± 57.84	土0.00	土0.00	土0.00	土57.84	±0.00	土0.00	十0.00	土0.00	± 0.00	± 0.00	土0.00
α -ttISRFSR	± 55.69	土0.00	土0.00	土0.00	±0.00	±0.00	土0.00	±0.00	土0.00	± 0.00	± 55.69	土0.00
α -syst W t Xsec	± 48.29	±0.00	± 48.29	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
α_syst Z Xsec	± 43.05	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 43.05	±0.00	±0.00
CellOut energy resolution	±39.00	±0.01	士7.41	±0.20	±0.40	±0.04	±0.20	±0.03	10.00 - 200	12.12.1	±1.09	± 0.00
Jet energy scale Tumi	107.70 1.01	±0.04	Н4.44 Н6 78	11.0 +	H0.07	#0.08	±0.04	0T.UT	10.97 +1 38	60.01 H	170.00 +0.00	
\sim shane mostat $t\bar{t}$ <i>CB</i> obs BDTG hin 0	+21.40	10.01	+0.00	+0.00		e0.01+	+0.00	00.00+	00.0+	0000+	+21.40	0000+
Jet energy resolution	± 18.92	±0.00	± 5.52	± 0.10	± 13.76	± 0.29	± 1.12	± 0.43	± 9.62	± 23.18	± 6.48	土 0.00
γ -shape-mcstat-Z-CR-obs-BDTG-bin-0	± 15.82	土0.00	土0.00	土0.00	± 0.00	±0.00	土0.00	一 0.00	土0.00	± 15.82	±0.00	土0.00
γ -shape-mcstat- Wt - CR -obs-BDTG-bin-0	± 10.39	± 0.00	± 10.39	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
lpha-syst WW Sec	± 7.58	± 0.00	± 0.00	± 0.00	± 7.58	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- DY - CR -obs-BDTG-bin-0	± 4.95	土0.00	±0.00	±0.00	±0.00	±0.00	±0.00	十0.00	± 4.95	± 0.00	± 0.00	土0.00
γ -shape-mcstat- WW - CR -obs-BDTG-bin-0	± 2.54	±0.00	±0.00	±0.00	± 2.54	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00
α-W ZGenerator	1.7 1.7	00.0	10.00	1000	±0.00	00.0 1 1 1	1.1.2. T	±0.00	00.0∏ +	00.01 + 0.00	00.01 1	10.00 +
a Syst I plusAsed	97 1 46		00.0H	00.0H		±0.00 +1.46		00 0+	00.0H	00.04	00.04	
α -syst W Z Xsec	± 1.16	±0.00	±0.00	±0.00	±0.00	±0.00	± 1.16	±0.00	±0.00	±0.00	±0.00	土0.00
γ -shape-mestat-WZ-CR_obs_BDTG_bin_0	± 0.93	土0.00	土0.00	土0.00	土0.00	土0.00	± 0.93	±0.00	土0.00	土0.00	±0.00	土0.00
γ -shape-mcstat- <i>H</i> - <i>CR</i> -obs-BDTG-bin-0	± 0.39	± 0.00	± 0.00	± 0.39	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
α -systtZXsec	± 0.36	± 0.36	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mestat_ttW + ttZ + ttW W_CR_obs_BUTG_bin_U	±0.27	0.04	±0.00	±0.00	00.01 +	±0.01	00.01 + 0.00	10.27 10.00	00.04 +	+ ±0.00	00.01 1	10.00 1 + 0.00
o svst Z Z Xsec	+0.16	+0.00	+0.00	+0.00	+0.00	+0.16	+0.00	10.00	+0.00	00.0+	00.0+	+0.00
γ -shape-mestat- $tZCR$ obs_BDTG_bin_0	± 0.04	土0.04	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	±0.00	土0.00
in_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_t $\bar{t}W + t\bar{t}Z + t\bar{t}WW$ _SR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-WZ-SR-obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -snape-mestat- $DY = VK_{-}ODS_{-}DUIG_{-}DIN_{-}U$	00.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	00.0 1 1 1 0 0 1	00.0∏	± 0.00	±0.00	00.0 1 1	00.00 ₩	±0.00	00.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0.00 +	0.00 H +	± 0.00
\sim share mostat $t\bar{t}W \pm t\bar{Z} \pm t\bar{t}WW V R$ obs BDTG bin 0	0.00	000	00.01	000	00.0+	8.0+	0000+	00.01 +0.00	00.04	0.01+	00.04	
γ -shape-mestat DY SR_{obs} BDTG-bin-0	+0.00	± 0.00	± 0.00	± 0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	$\pm 0.00 \pm$	± 0.00
γ -shape-mcstat-Z-VR-obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
lpha-FakesSyst	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $t\bar{t}$ - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	土0.00	十0.00	± 0.00	± 0.00	± 0.00	土0.00
γ -shape-mcstat- tZ_VR -obs_BDTG-bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	十0.00	±0.00	±0.00	± 0.00	土0.00
γ_shape_mcstat_Z_SR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ_shape_mcstat_ZZ_VK_obs_BDTG_bin_0	00.0∏	±0.00	±0.00	± 0.00	±0.00	00.01 +	±0.00	±0.00	±0.00	00.0 -	00.0 1 1 1 0 0 0 0 0	± 0.00
γ -shape-mestat- $W t_{-}V h_{-}$ obs- $b U G$ -bin-0	00.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	00.0 1 1 1 0 0 1	00.0∏	± 0.00	±0.00	00.0 1 1	00.00 ₩	±0.00	00.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0.00 +	0.00 H +	± 0.00
γ shape mostat $WW SR$ obs BDTG bin 0	0.00	000	00.01	000	00.0+	8.0+	0000+	00.01 +0.00	00.04	0.01+	00.04	
\sim shape mostat Wt SR obs BDTG bin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
γ -shape-mestat_H_SR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	土0.00
γ -shape-mcstat- $Fakes$ - SR -obs-BDTG-bin-0	± 0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	±0.00	土0.00	土0.00	±0.00	土0.00
γ -shape-mcstat- <i>H</i> - <i>VR</i> -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_tt_VR_obs_BDTG_bin_0	土0.00	土0.00	土0.00	土0.00	土0.00	±0.00	土0.00	±0.00	土0.00	± 0.00	± 0.00	土0.00
γ -shape-mostat- WW - VR -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mestat- WZ_VR_0 bs-BDTG_bin_0 γ -shape-mestat- WZ_VR_0 bs-BDTG_bin_0	00.01 +0.00	00.01 +0.00	+0.00	+0.00	+0.00	00.01 +0.00	+0.00	±0.00	+0.00	+0.00	+0.00	+0.00
		J	J	i	í	ſ	1		Į	J	J	i

Table 20: Breakdown of the dominant systematic uncertainties on background estimates in CR_4^{SF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

	C115	71	2 11	Ч	ΜM	22	ZM	$t\bar{t}W + t\bar{t}Z + t\bar{t}WW$	DY	Ň	tt	Fakes
Total background expectation	14687.67	1.77	580.16	24.26	303.91	4.68	39.26	36.84	292.89	1274.94	12128.96	0.00
Total background error	± 1665.52	± 1.76	± 124.26	± 2.15	± 86.15	土3.84	土4.83	土8.33	土71.13	± 355.40	± 1531.30	±0.00
α -syst $t\bar{t}X$ sec	± 1212.90	± 0.00	土0.00	土0.00	±0.00	±0.00	土0.00	十0.00	±0.00	±0.00	± 1212.90	±0.00
Jet energy scale	± 661.50	±0.07	± 30.76	± 1.54	± 18.95	±0.30	±2.09	±0.93	± 12.25	± 75.89	± 518.72	±0.00
α_{-ttP} artons nower α_{-tTP}	±485.16 ±450.16	00.0 +	00.01 +0	00.0 +	00.0∓	8.0 ₩	00.0 +	±0.00 +0.00	00.0∓	00.0 1 1 0 0 0 0 0 0 0 0 0 0 1	土485.16 十750-16	00.0
v trigger	+440.63	+0.05	+17.40	+0.73	+9.12	+0.14	+1.18	+1.11	62.8+	+38.25	+363.87	00.04
CellOut energy scale	+238.55	+0.05	+7 10	+0.48	+2.02	+0.18	+0.06	+0.04	+42.55	+114.31	+71.74	+0.00
$\alpha_z Z$ Generator	± 198.81	± 0.00	+0.00	± 0.00	± 0.00	+0.00	± 0.00	± 0.00	+0.00	± 198.81	+0.00	+0.00
α -svstZXsec	± 191.24	±0.00	±0.00	±0.00	±0.00	+0.00	±0.00	±0.00	+0.00	± 191.24	±0.00	±0.00
Jet energy resolution	± 178.57	± 0.03	± 2.82	± 0.35	± 8.33	± 0.14	± 1.07	± 0.47	± 36.42	± 114.03	± 34.00	± 0.00
$\alpha_{-}JVF$	± 156.33	± 0.00	± 10.28	± 0.14	± 8.36	± 0.21	± 0.65	± 0.07	± 3.13	± 36.64	± 96.84	± 0.00
$lpha$ _systWtXsec	± 116.03	± 0.00	± 116.03	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
αWW Generator	± 80.64	± 0.00	土0.00	± 0.00	± 80.64	土0.00	土0.00	十0.00	土0.00	±0.00	± 0.00	± 0.00
Lumi	± 71.64	± 0.05	± 16.24	± 0.68	± 8.51	± 0.13	± 1.10	± 1.03	± 8.20	± 35.70	±0.00	±0.00
CellOut energy resolution	± 67.32	±0.01	± 6.54	± 0.23	10.00 1 10	±0.09	± 0.27	± 0.15	± 12.79	± 28.91	± 18.81	00.00 ++
α -riteup α shows worket ii CD she DDTC his D	王54.41 上90.96	T0.01	±0.00	80.0H	Н4-19	10.01 H 1	10.0H	10.01	10.00H	H113./U	191.40 1 20 26	
γ shape mostat $Z CR$ obs BDTG bin 0	± 23.27				00.04	8.0		10.00 +0.00	00.0H	±0.00	1.000 H	00.04
γ _shape_mcstat_Wt_CR_obs_BDTG_bin_0	± 16.05	±0.00	± 16.05	十0.00	±0.00	±0.00	±0.00	±0.00	±0.00	+0.00	+0.00	±0.00
α -syst WWX sec	± 15.20	± 0.00	± 0.00	± 0.00	± 15.20	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ _shape_mcstat_ $DY_CR_obs_BDTG_bin_0$	± 12.38	± 0.00	± 0.00	± 0.00	土0.00	土0.00	土0.00	土0.00	± 12.38	±0.00	±0.00	土0.00
α -ttISRFSR	± 11.49	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	土0.00	土0.00	±0.00	± 11.49	±0.00
α_syst'l'plusXsec	±8.11	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 8.11	±0.00	±0.00	+0.00	±0.00
α_ZZGenerator	±3.79 ±3.64	±0.00	00.0H	00.0 1 1	±0.00	±3.79	±0.00	±0.00	00.0∏	00.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	00.00 +	00.0 1 1 0
γ = Sitape-intestate W = γ = syst W Z X = γ	+2.04	00.04			+0.04 +0.04	8.0	+2.75	+0.00	00.01 +		00.01 +	0.01
αWZ Generator	+2.26	+0.00	+0.00	+0.00	+0.00	+0.00	+2.26	+0.00	+0.00	+0.00	+0.00	+0.00
α -systtZXsec	± 1.76	± 1.76	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- WZ - CR -obs-BDTG-bin-0	± 1.42	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 1.42	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$mu_t\bar{t}SF$	± 1.21	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	土0.00	土0.00	土0.00	± 1.21	±0.00
γ_shape_mcstat_H_CR_obs_BDTG_bin_0	±0.92	±0.00	±0.00	± 0.92	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	+0.00	±0.00
γ -shape-mcstat-ttW + ttZ + ttW W -CK_obs-BDTG-bin-U	10.55 10.55	±0.00	00.00 +	10.00 1	00.01 +	10.00 1 ± 0.00	±0.00	±0.00	00.01 1	00.00 ++	0.00 +	00.04 +
7-Shape-Intestated 2-0 A-008-DD I G-011-0 a syst 27X ser	10.40 +0.23				00.0H	07.0 1 1 0 7 7		±0.00 +0.00	00.0H	00.04	00.01 +	
\sim shape mostat $tZ CR$ obs BDTG bin 0	60.0+	+0.09	+0.00	+0.00	+0.00	00.04	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat- $Fakes$ - CR -obs-BDTG-bin-0	±0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	±0.00	土0.00	±0.00	±0.00	±0.00
γ _shape_mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW_SR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $WZ_SR_obs_BDTG_bin_0$	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	土0.00	±0.00	±0.00	±0.00	±0.00
7_shape_mcstat_DY_VK_obs_BDTG_bin_0	00.00 +	±0.00	00.00 +	±0.00	±0.00	0.0 ₩	± 0.00	±0.00	±0.00	00.00 +	±0.00	00.0 <u>+</u>
\sim share mestat $t\bar{t}N \perp t\bar{t}N \perp t\bar{t}N/N V R$ of RDTC bin 0	00.0+										- 00.00 + 0.00	
γ -shape-mestat- $DY_SR_obs_BDTG_{bin-0}$	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	十0.00	±0.00	十0.00	±0.00	±0.00
γ -shape-mcstat_ZZ_VR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_Z-VR_obs_BDTG_bin_0	土0.00	± 0.00	土0.00	土0.00	土0.00	十0.00	土0.00	土0.00	土0.00	± 0.00	土0.00	±0.00
α -FakesSyst	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	± 0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mestat_tt_SR_obs_BDTG_bin_0	±0.00	±0.00	+0.00	±0.00	±0.00	00.00 ++	±0.00	± 0.00	±0.00	00.00 +	+0.00	±0.00
γ-snape-mestat-t∠-V A-obs_BD1G_DIA_0	00.01 +0	00.01 ₩	00.0H	00.01 1	00.0 1 1	00.0 ₩	00.0 1 1	±0.00	00.0 1 1 0 0 0 1 1 0 0 0 1	0.00 H H	00.00 +	00.0 ∏ +
7-suape_incstat_∠_2 n_00s_DU I G_0111_0 ~ chane mostat 11/4 1/R ohe RDTC hin 0	00.01 +0.00				00.0H	8.0		±0.00 +0.00	00.0H	00.04	00.01 +	
γ shape mostat $Fakes VR$ obs BDTG bin 0	00.0+	00.0+	00.0+	00.0+	0000+	000	000+	+0.00	00.0+	00.0+	00.0+	00.0+
γ -shape-mestat- H - SR -obs- $BDTG$ -bin-0	+0.00	±0.00	+0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	+0.00	+0.00	±0.00
γ -shape-mcstat- WW - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ _shape_mcstat_Wt_SR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ _shape_mcstat_ $Fakes_SR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $H_VR_obs_BDTG_bin_0$	土0.00	± 0.00	土0.00	± 0.00	± 0.00	土0.00	土0.00	土0.00	土0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-tt-VR-obs-BDTG-bin-0	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mestat-W W -V R-obs-BDTG-bin-0	±0.00	00.00 ₩	10.00 1	00.04 1	00.0 1 1 1 0	8.0 ₩	00.00 +	±0.00	00.01 1 − 00	10.00 1 ±0.00	100.00 1 + 0.00	00.04 1
γ -shape-mestat-WZ-VR-obs-BDTG-bin-0	+0.00	+0.00	+0.00	+0.00	+0.00	00.00+	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00

Table 21: Breakdown of the dominant systematic uncertainties on background estimates in CR_5^{SF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

i expectation 1 i error 1 <th>96 1.77</th> <th>7 580.31</th> <th>24.27</th> <th>304.03</th> <th>4.68</th> <th>39.27</th> <th>26 85</th> <th>292.99</th> <th>1275.39</th> <th>12376.40</th> <th>0.00</th>	96 1.77	7 580.31	24.27	304.03	4.68	39.27	26 85	292.99	1275.39	12376.40	0.00
							00.00				
	.93 ± 1.76	6 ± 123.44	± 2.14	± 85.59	土3.81	± 4.80	±8.28	±70.71	± 352.95	± 474.61	±0.00
8											
8	3.69 ± 0.00	00 ±0.00	±0.00	土0.00	±0.00	±0.00	土0.00	±0.00	±0.00	± 1713.69	±0.00
9			00.0 1 -	110.0U	00.0 1 −	± 0.00	±0.00	00.0H	1 7. CO	±1771.18	00.0∏
-			H 000	H10.04	67.0H	00.7 H	±0.92 +0.00	177.70 +0.00	H /3.30	±320.17 +491.65	00.0H
5			+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+465.33	+0.00
8			+0.72	+9.06	+0.14	+1.17	+1-10	+8.73	+38.00	+368.71	+0.00
-		5 ± 7.07	± 0.48	± 2.01	± 0.18	± 0.06	± 0.04	± 42.35	± 113.79	± 72.85	± 0.00
9	$.51 \pm 0.00$		土0.00	十0.00	土0.00	±0.00	±0.00	土0.00	± 197.51	±0.00	十0.00
9			± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 189.95	± 0.00	± 0.00
-				± 8.27	± 0.14	± 1.07	± 0.46	± 36.18	± 113.27	± 34.45	± 0.00
-				± 8.32	± 0.21	± 0.65	± 0.07	± 3.12	± 36.43	± 98.23	± 0.00
9			± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
5			±0.00	± 80.11	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
-			± 0.68	± 8.47	± 0.13	± 1.09	± 1.03	± 8.17	± 35.54	± 0.00	±0.00
9			± 0.23	±0.00	±0.09	± 0.27	± 0.15	± 12.70	± 28.72	± 19.06	±0.00
9			±0.08	±4.16	10.01 +	10.01 + 0.01	10.01 +0.00	±35.83	± 112.96	±92.70	00.0 + 0.00 + 0.00
0	94 ±0.00		00.0 +0.00	00.01 +0.00	8.0 H +	00.0 H +	±0.00 +0.00	10.00 +	00.0H	Н 39.94 + 96.16	00.0H
e			± 0.00	± 0.00	±0.00	± 0.00	± 0.00	+0.00	± 23.15	± 0.00	± 0.00
0			± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
0			± 0.00	± 15.10	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
<i>WW_CR</i> _obs_BDTG_bin_0			± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 12.31	± 0.00	± 0.00	± 0.00
WW_CR_obs_BDTG_bin_0			土0.00	土0.00	±0.00	土0.00	± 8.05	±0.00	十0.00	十0.00	±0.00
W W -C K-obs-BDTG-bin-0	77 ± 0.00		± 0.00	± 0.00	± 3.77	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00
			±0.00	± 3.62	±0.00	±0.00	± 0.00	±0.00	±0.00	+0.00	±0.00
0 IV 7Concentron +			00.01 + 0	00.0∏	0.0 ₩	H 2. / 3 H 2. / 3	10.00 10.00	00.01 +	00.00 +	10.00	00.0 1 1 1
			00.0 +	00.0+	8.0	+0.00+	00.0+	00.0+	00.0+	+0.00	00.0+
$\gamma_{-\text{shape-mcstat-}WZ-CR_obs_BDTG_bin_0}$ ± 1.42	42 ±0.00		±0.00	±0.00	±0.00	± 1.42	十0.00	±0.00	±0.00	±0.00	±0.00
			± 0.91	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW_{-}CR_{-}$ obs_BDTG_bin_0 ± 0.55			± 0.00	± 0.00	土0.00	± 0.00	± 0.55	± 0.00	± 0.00	± 0.00	± 0.00
$t_Z Z_C R_o bs_BDTG_{bin_0}$			± 0.00	±0.00	± 0.24	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
$\alpha_{\text{-syst}ZZX\text{sec}} \pm 0.23$	23 ±0.00		± 0.00	±0.00	± 0.23	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00
γ -snape-mcstat-tz- CR_{-0} show more tz r_{2} - CR_{-0} show more tz r_{2} - r_{2} show more tz r_{2} - r_{2} show $r_{$		00.0 1 ±0.00	00.01 + 0.00	00.0 1 1	B.0 1 1	00.01 +	10.00 10.00	00.01 +	00.01 1	00.01 1	00.0 ∏
γ shape mostate $t\bar{t}W + t\bar{t}Z + t\bar{t}WW SR$ obs BDTG bin 0 +0.00 \pm 0.00	00 + 00		00.0 +	00.0+	0.00	0000+	+0.00	00.0+	+0.00	+0.00	00.0+
			±0.00	±0.00	±0.00	±0.00	土0.00	±0.00	±0.00	±0.00	±0.00
0			± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
			± 0.00	± 0.00	土0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
obs_BD'I'G_bin_0			±0.00	±0.00	0.00 ++	±0.00	± 0.00	+0.00	±0.00	+0.00	±0.00
γ-snape_mcstat_D1_SK_0DS_BD1G_DILU ~ shane mostet Z VR abs RDTC hin 0 +0 00			00.0 +	00.0 +0	B.0 ₩	0.0 1 1	±0.00 +0.00	00.0 +	00.01 +0	00.01 1	00.0 ₩
	00 ± 0.00	00 = ±0.00	±0.00	±0.00	±0.00	±0.00	十0.00	±0.00	±0.00	±0.00	±0.00
$\operatorname{at}_{t\overline{t}}SR_{o}\operatorname{bs}BDTG_{bin_{0}}$			± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
0			± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
			± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
			± 0.00	±0.00	±0.00	±0.00	土0.00	±0.00	±0.00	±0.00	±0.00
		00 ±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
0			± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	+0.00	±0.00
γ-shape_mcstat_W W_5K_0DS_BUTG_bin_U	00 ± 000	00 1 ± 0.00	10.00 +000	00.01 +0	0.0 1 1 1	00.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	±0.00	±0.00	00.01 +0.00	10.00 +0000	00.0 1 1 1 0 0 1 1 0 0 1 1 0 0 1
			00.0 +	00.0+	8.0		+0.00	00.04	00.04	+0.00 +	0000+
in-0			+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
			土0.00	± 0.00	土0.00	±0.00	±0.00	±0.00	±0.00	±0.00	土0.00
			± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
0			土0.00	± 0.00	土0.00	土0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-ZZ-SK-obs-BDTG-bin-0 ± 0.00	00 # 0.00	00.00 +0.00	±0.00	±0.00	00.00 + +	±0.00	±0.00	±0.00	00.00 +	+0.00	00.00 +
			H n.un	HU.UU	В0.0H	H U. U	Ξυ.υυ	Hu.UU	±u.uu	±0.00	n.uH

Table 22: Breakdown of the dominant systematic uncertainties on background estimates in CR_5^{SF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	0.00 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 10000 <th>$\begin{array}{ c c c c c c c c c c c c c c c c c c c$</th> <th>$\begin{array}{c} 0.81 \\ \pm 0.24 \\ \pm 0.20 \\ \pm 0.00$</th> <th>$\begin{array}{c ccccccccccccccccccccccccccccccccccc$</th> <th>$\begin{array}{c} 4.64\\ +4.64\\ +4.80\\ +4.60\\ +4.60\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ 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65.53 \\ \pm 14.74 \\ \pm 14.74 \\ \pm 10.92 \\ \pm 55 \\ \pm 5.18 \\ \pm 5.18 \\ \pm 25.18 \\ \pm 25.$</th> <th>$\begin{array}{c c} 36.08 \\ \hline 36.08 \\ \hline 19.81 \\$</th>	$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	$\begin{array}{c} 0.81 \\ \pm 0.24 \\ \pm 0.20 \\ \pm 0.00 $	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	$\begin{array}{c} 4.64\\ +4.64\\ +4.80\\ +4.60\\ +4.60\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ +2.000\\ 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$\begin{array}{cccccccccccccccccccccccccccccccccccc$			±0.28 ±10.20 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20.00 ±20	+ - 0.00 + - 0.00 + - 0.00 + - 0.00 + - 0.00 + - 0.00 + - 0.00 + - 0.00 + - 0.00 + - 0.00 + - 0.00 + - 0.00 + - 0.00 + - 0.00 + - 0.00 + + 0.00 + + 0.00 + + 0.00 + + 0.00 + + 0.00 + + + + + + + + + + + + + + + + + +	±0.00 ±0.01 ±0.01 ±0.01 ±0.01 ±0.01 ±0.01 ±0.01 ±0.01 ±0.01 ±0.01 ±0.01 ±0.01 ±0.01 ±0.01 ±0.01 ±0.01 ±0.01 ±0.01 ±0.01 ±0.01 ±0.01		+ 0.0 + 0.0 + 0.0 + 0.0 + 0.0 + 0.0 + 0.0 + 0.0 + 0.0 + 0.0 + 0.0 0.0 0.0 + 0.0 0.0 0.0 + 0.0 + 0.0 0.0 0.0 + 0.0 + 0.0 0.0 0.0 + 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 <td>$\begin{array}{c} \pm 4.80 \\ \pm 4.80 \\ \pm 0.00 \\ \pm 0.0$</td> <td></td> <td>119.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81</td>	$\begin{array}{c} \pm 4.80 \\ \pm 4.80 \\ \pm 0.00 \\ \pm 0.0$		119.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81 1219.81
$\begin{array}{c} \pm 19.81 \\ \pm 10.81 \\ \pm 5.18 \\ \pm 6.55 \\ \pm 11.48 \\ \pm 6.55 \\ \pm 0.00 \\ \pm 4.64 \\ \pm 3.78 \\ \pm 0.00 \\ \pm 3.78 \\ \pm 0.00 \\ \pm 1.34 \\ \pm 0.00 \\ \pm 1.34 \\ \pm 0.00 \\ \pm $			$\begin{array}{c} \pm \pm 0.00 \\ \pm 0.00 \\ \pm \pm 0.00 \\ \pm$	$\begin{array}{c} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 $	++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 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$\begin{array}{cccccccccccccccccccccccccccccccccccc$			± 0.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00 ± 10.00 ± 0.00	$\begin{array}{c} + & - & - & - & - & - & - & - & - & - &$	± 0.00 ± 0.00		中	+ 0.00 + 0.000 + 0.00 + 0.000 + 0.0000 + 0.000 + 0.000 + 0.0000 + 0.00000 + 0.0000 + 0.00000 + 0.00000 + 0.0000 + 0.0000		+ 0.00 + 0.00
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$\begin{array}{cccccccccccccccccccccccccccccccccccc$			$\begin{array}{c} \pm 0.00\\ \pm 0.00\\ \pm 0.00\\ \pm 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.0$	0.00000000000000000000000000000000000	± 0.00 ± 0.07 ± 0.07 ± 0.00 ± 10.00 ± 10.00		1000000000000000000000000000000000000	+ 0.00 + $+$ 0.00 + $+$ 0.00 + 0.00 + 0.00		++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			± 0.04 ± 0.00 ± 10.00 ± 0.00 ± 0.00 ± 0.00	0.00000000000000000000000000000000000	± 0.07 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.03 ± 0.03		0.00 00.00 00.00 00.00 00.00 00.00 00 00	± 0.22 ± 0.00 ± 10.00 ± 10.00		+0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			0.00000000000000000000000000000000000	0.000 ± 10.000	± 0.00 ± 0.00 ± 0.07 ± 0.03 ± 0.03		00.00 00.00 00.00 00.00 00.00 00.00 00 0	100000 100000 100000 100000 100000 100000 100000 100000 100000 100000 100000 100000 100000 100000 1000000		+++0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			00.00 00.00 00.00 00.00 00.00 00 00 00 0	00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.000000	±0.07 ±0.07 ±0.03 ±0.03		00.00 00.00 00.00 00.00 00.00 00 00 00 0	00.00 00.00 00.00 00.00 00 00 00 00 00 0		日本 1000000000 1000000000000000000000000
) ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.02 ± 0.00 ± 0.02 ± 0.00 ± 0.01 ± 0.01 ± 0.01 ± 0.01 ± 0.01 ± 0.00			00.00 00.00 00.00 00.00 00.00 00 00 00 0	00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00	±0.00 ±0.00 +0.03		00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.000000	00.00 + + +		
$\begin{array}{c} \begin{array}{c} 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 $			0000 10000 10000 10000 10000	00.00 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	±0.03 +0.03		00.00 10.00 10.00	00.04		# 0.00
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2001 ±0.00 ±0.01 ±0.00 ±0.01 ±0.00 ±0.01 ±0.00 ±0.00 ±0.00 ±0.000 ±0.00 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.000 ±0.0000 ±0.000 ±0.000 ±0.0000 ±0.0000 ±0.000 ±0.0000 ±0.0000 ±0.00			+0.00	000-1	;;;		22.24	土0.00		±0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$				±0.00	± 0.01		± 0.00	± 0.00		
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			± 0.00	± 0.00	± 0.00		± 0.00	± 0.00		±0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			± 0.01	± 0.00	± 0.00		±0.00	± 0.00	土0.00	土0.00
2000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 0000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 00000 ± 000000			±0.00	±0.00	±0.00		±0.00	±0.00	± 0.01	±0.00
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$\begin{array}{cccccccccccccccccccccccccccccccccccc$			0000+	+0.00	+0.00		00.0+	+0.00	00.0+	000++
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			±0.00	十0.00	±0.00		±0.00	十0.00	土0.00	十0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
0 $\pm 0.00 \pm 0.00$ $\pm 0.00 \pm 0.00$			±0.00	± 0.00	± 0.00		±0.00	± 0.00	±0.00	±0.00
±0.00 ±0.00	0.00 ± 0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
			0.0 1 +	00.0H	00.0∏		0.0 ₩	10.00 1	-0000	0.0 ₩ +
			8 0 H	00.04	00.04		00.04			
			8.0	00.0+	000+		00.04	000+		800+
0 + 0.00 + 0.00			00.0+	00.01	+0.00		0000+	0000+	00.0+	00.01
obs BDTG hin $0 \pm 0.00 \pm 0.00$		+0.00	00.0+	+0.00	+0.00		00.0+	+0.00	00.0+	0.00+
+0.00 + 0.00			+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
$\pm 0.00 \pm 0.00$			±0.00	± 0.00	± 0.00		±0.00	± 0.00	±0.00	+0.00
<u> </u>			土0.00	± 0.00	± 0.00		±0.00	± 0.00	±0.00	土0.00
1000 1000 1000 1000 1000 1000 1000 100			± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	土0.00
$\pm 0.00 \pm 0.00$			± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
-0 ±0.00 ±0.00			± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
$\pm 0.00 \pm 0.00$			± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	土0.00
± 0.00 ± 0.00			±0.00	±0.00	±0.00		±0.00	± 0.00	±0.00	±0.00
$\pm 0.00 \pm 0.00$			#0.00	±0.00	±0.00		00.00 -	±0.00	±0.00	±0.00
γ-snape_mcstat_ <i>k</i> akes_CK_005_BD1G_DIN_U ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00	0.00 ±0.00	00.0 H +	8.0 H +	00.0 ₩	00.0 ₩	10.00 +0.00	00.0 1 1	00.0 +	10.00 +0.00	00.04

Table 23: Breakdown of the dominant systematic uncertainties on background estimates in VR_1^{DF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Uncertainty of channel	$V H_1^{-1}$	27	2 4 4									
Total background expectation	94.63	0.01	6.02	0.02	0.14	0.00	0.12	0.81	0.00	4.63	46.79	36.08
Total background error	± 21.41	± 0.01	± 2.49	± 0.02	± 0.26	土0.00	± 0.11	土0.24	土0.00	土4.77	± 6.22	± 19.83
	10 01 -	0000	0000	00 0 -	000	000	000	00 0	00 0 -	0000	00 01	10 01 1
7_SHAPE-IIICState_r akes_V n_008_DD 1G_0111_0 Tet enerwy scele	10.61 +8.38	00.0H	00.01 H 0.01	8.0 H +	00.01 H 0.06	00-0+	0.04 10.04		B 0	0.0H	H0.00 +733	10.01 +0.00+
mil $t\bar{t}DF$	+6.36	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	00.01+	+0.00	+0.00	+6.36	+0.00
α _systt $t\bar{t}$ Xsec	± 4.62	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 4.62	±0.00
$\alpha Z Generator$	± 4.60	土0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 4.60	± 0.00	土0.00
α -t \overline{t} GenPlusPS	± 3.67	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 3.67	± 0.00
$\alpha_{-t\bar{t}\bar{1}ISRFSR}$	± 2.45	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 2.45	± 0.00
	± 2.04	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 2.04	± 0.00
γ -shape-mcstat- $WtVR$ obs_BDTG_bin_0	± 1.76	土0.00	± 1.76	土0.00	土0.00	土0.00	± 0.00		± 0.00	土0.00	± 0.00	土0.00
Lumi	± 1.33	±0.00	± 0.17	±0.00	土0.00	±0.00	±0.00		±0.00	± 0.13	±0.00	± 1.01
α -syst Wt Xsec	± 1.19	±0.00	± 1.19	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
CellUut energy scale	±1.18	±0.00	±0.08	00.0 ₩	±0.00	±0.00	±0.01	±0.04	00.0 ₩	±0.07	±1.04	00.0 ₩
	10.1 1 1	±0.00	10.29	0.0 ₩	10.01 -	00.0∏	±0.00		00.0 1 −	±0.41	10.37	00.0∏
CellOut energy resolution	07.0H	00.0H	01.04	00.0H		00.0H	00.04		00.04	77.0H	10.40	
v syst Z X ser	00+	00.0+	00.0+	8.0	000+	000+	000+		000	090+	00.0+	8.0
a_JVF	+0.53	+0.00	+0.08	+0.00	+0.00	+0.00	+0.00		+0.00	+0.08	+0.36	+0.00
Jet energy resolution	± 0.30	±0.00	± 1.25	±0.00	± 0.04	± 0.00	± 0.07		± 0.00	± 0.22	± 1.18	±0.00
\alphaWWGenerator	± 0.24	± 0.00	± 0.00	± 0.00	± 0.24	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
lpha-systTplusXsec	± 0.18	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
α -FakesSyst	± 0.09	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.09
γ -shape-mcstat_ $ttW + t\bar{t}Z + t\bar{t}WW_VR_obs_BDTG_bin_0$	± 0.08	±0.00	±0.00	±0.00	土0.00	±0.00	土0.00		±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- $WZ-VR$ -obs-BDTG-bin-0	± 0.07	±0.00	±0.00	±0.00	± 0.00	±0.00	± 0.07		±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- $W W - V R$ -obs- $BDTG$ -bin-0	±0.06	±0.00	±0.00	00.0 ₩	±0.06	00.0 1	±0.00	±0.00	± 0.00	±0.00	±0.00	00.0 ₩
α_{-W} ZGEIICLAUOT \sim share mostat H VR obs RDTC hin 0	20.0H	00.0H	00.04	8.0+		00.04	0000+		800 H +	00.04		8.0
α -svstWZXsec	+0.01	+0.00	+0.00	+0.00	+0.00	+0.00	+0.01		+0.00	+0.00	+0.00	+0.00
α -systtZXsec	± 0.01	± 0.01	± 0.00	±0.00	土0.00	± 0.00	± 0.00		± 0.00	±0.00	土0.00	±0.00
α -systWWXsec	± 0.01	± 0.00	± 0.00	± 0.00	± 0.01	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $tZ_VR_obs_BDTG_bin_0$	± 0.00	土0.00	± 0.00	土0.00	土0.00	土0.00	土0.00		土0.00	土0.00	土0.00	土0.00
γ _shape_mcstat_ZZ_VR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
α_ZZGenerator	00.01 +	±0.00	00.0±	00.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	10.00 + +	00.0 <u>+</u>	±0.00		00.0 1 1 0000 1 1 0000 1 1 0000 1 1 0000 1 1 0000 1 1 0000 1 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 0000 1 000000	±0.00	±0.00	00.0 H +
α -system zacec \sim share mostat DV VR obs BDTG him 0		00.01	00.04	8.0		0000+	00.0+		8.0	00.0+	00.0+	8.0
	+0.00	+0.00	± 0.00	+0.00	+0.00	± 0.00	± 0.00		± 0.00	+0.00	± 0.00	+0.00
γ -shape-mcstat- Wt - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	土0.00
γ -shape-mcstat- WZ - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- DY - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-H_SR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	00.00
γ_shape_mcstat_tt_CR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	#0.00
γ -shape-mestat- W $_SK$ -obs- $BDTG$ -bin- 0	00.0∏	±0.00	±0.00	00.0 ₩	± 0.00	10.00 00.01	#0.00		± 0.00	±0.00	±0.00	00.0 ₩
γ -shape-mestat-tz-CK-obs-BUIG-bin-0	00.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	00.0∏ +	00.0 1 1 1 0 0 0 1	00.0 ₩	10.00 1 ± 0.00	00.0∏	±0.00	±0.00	00.0 1 1 1 0 1 0 1 1 0 1 0 1 1 0 1 0 1 0	00.0 1 1 1 0 0 0 0 1	00.0 1 1 1 0 0 1	00.0 ₩
Y-snape-mcstat-W t_5K-008-BU I G-DIN-U	00.00 H H	00.0∏ +	00.0 1 1 1 0 0	00.0 ₩	10.00 1	00.0∏ +	100.01 1		00.0 ₩ +	00.0 1 1 1 0 0	00.0 1 1 1 0	00.0H
~ shape_IIICstat_2_2 A_UDS_DD_I G_DIII_U ~ shape mostat WZ SR obs BDTC bin 0		00.0H	00.0H	00.0H	00.0H	00.04	00.0H		00.0H	00.04		00.04
\sim share mostat $t\bar{t}W + t\bar{t}Z + t\bar{t}WW \ CR$ obs BDTG bin 0	0000+	+0.00	00.01+	0000+	+0.00	00.01+	+0.00		0000+	00.00+	+0.00	0000+
γ -shape-mestat- $t\bar{t}W + t\bar{t}Z + t\bar{t}WW$ -SR-obs-BDTG-bin-0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat- $Fakes$ - SR -obs-BDTG-bin-0	±0.00	±0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	±0.00
γ -shape-mcstat- <i>H</i> - <i>CR</i> -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ _shape_mcstat_ $DY_SR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- tZ - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $WWCR$ obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $ZZ_SR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $ZZ_CR_obs_BDTG_bin_0$	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	00.00
γ -shape-mestat- $Fakes-CR_obs_BDTG_bin_0$	±0.00	±0.00	±0.00	00.0 ₩	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
\sim shape mostar $Z_{-}(JR_{-}Obs_{-}BDTG_{-}Dh_{-}D)$		+	Ŧ									

Table 24: Breakdown of the dominant systematic uncertainties on background estimates in VR_1^{DF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Total background expectation	4	0.01	5.41	0.03	0.19	0.00	0.13	0.82	0.00	4.55	71.76	26.82
	109.72											
Total background error	土23.69	± 0.01	± 2.19	± 0.03	± 0.37	± 0.00	±0.08	± 0.24	±0.00	± 4.78	± 15.06	±17.17
γ -shape-mcstat- $Fakes$ - VR -obs-BDTG-bin-0	± 17.15	土0.00	土0.00	土0.00	±0.00	土0.00	土0.00	±0.00	土0.00	土0.00	土0.00	± 17.15
Jet energy scale	± 11.49	00.0	10.00 +	0.0 + +	±0.04	±0.00	00.0±		00.0 ₩ +	1.8.0 1 1	±11.02	00.04 +
a-systeration A ##Gen Plus PS	1 + 2 2 2 2	00.01	00.0+	8.0	80		00.04		8.0		+2 28 +2 28	8.0
o ZGenerator	+4.55	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+4.55	00.0+	+0.00
γ -shape-mestat- $t\bar{t}$ - VR -obs-BDTG-bin-0	± 3.07	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	土 0.00	± 3.07	±0.00
Jet energy resolution	± 2.01	± 0.00	± 0.59	± 0.01	± 0.02	± 0.00	± 0.01		± 0.00	± 0.47	± 2.01	± 0.00
CellOut energy scale	± 1.97	± 0.00	± 0.35	± 0.00	± 0.02	± 0.00	± 0.00		± 0.00	± 0.14	± 2.13	± 0.00
a-PileUp	± 1.89	± 0.00	± 0.60	± 0.00	± 0.02	± 0.00	± 0.00		± 0.00	± 0.30	± 0.96	± 0.00
CellOut energy resolution	± 1.62	± 0.00	± 0.14	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.36	± 1.39	± 0.00
γ -shape-mcstat- Wt - VR -obs-BDTG-bin-0	± 1.59	± 0.00	± 1.59	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
a_tīlsRFSR	± 1.24	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 1.24	± 0.00
α -syst Wt Sec	± 1.08	± 0.00	± 1.08	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
Lumi	± 1.06	± 0.00	± 0.15	± 0.00	± 0.01	± 0.00	± 0.00	± 0.02	± 0.00	± 0.13	± 0.00	± 0.75
$\alpha_{-}JVF$	± 0.77	土0.00	± 0.00	土0.00	± 0.00	土0.00	土0.00		± 0.00	± 0.03	土0.74	± 0.00
γ -shape_mcstat_Z_VR_obs_BDTG_bin_0	± 0.73	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	± 0.73	±0.00	±0.00
a_systZXsec	± 0.68	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	± 0.68	±0.00	±0.00
α_W W Generator	+0.30 +0.10	00.0 1 1 0 0 0 0 1 0 0	00.0 + + 000	0.0 ₩	H 0.30	10.00 1	10.01 1	10.00 + 0 + 0	00.0H	± 0.00	10.00 1	00.04 H H
α system processor \sim share mestat $t\overline{t}W \pm t\overline{t}Z \pm t\overline{t}WW VR$ ohs BDTC him 0	01-0 H +		00.0H	8.0 H +			00.0H				00.0H	B 00 H +
	+0.08	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.08
γ -shape-mcstat- $WW_VR_obs_BDTG_bin_0$	± 0.08	土0.00	±0.00	±0.00	± 0.08	土0.00	±0.00		土0.00	土0.00	土0.00	土0.00
γ -shape-mcstat- $WZ-VR$ -obs-BDTG-bin-0	± 0.07	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.07		± 0.00	± 0.00	± 0.00	± 0.00
αWZ Generator	± 0.03	土0.00	土0.00	±0.00	±0.00	土0.00	± 0.03		土0.00	土0.00	土0.00	± 0.00
γ -shape-mcstat- H_VR_obs -BDTG-bin-0	± 0.02	±0.00	±0.00	± 0.02	±0.00	±0.00	±0.00		±0.00	± 0.00	±0.00	±0.00
a_systW Z Asec	±0.01	±0.00	#0.00	±0.00	±0.00	±0.00	±0.01		#0.00	± 0.00	±0.00	±0.00
austry W Asec	±0.01	±0.01	00.0∓	0.0 ₩	10.0 +	00.0	00.0#	±0.00	00.0 1 1 1 0 0 1 1	00.0 1 1 0 0 0 0 1 0 0 0 1 0 0 1 0 0 0 1 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	00.0∓	00.04 1
$\frac{d}{dt}$ multiple	+0.01	+0.00	+0.00	00.0+	00.0+	0000+	+0.00		0000+	+ 0.00	+0.01	00.01+
γ -shape-mestat- tZ_VR_o ohs-BDTG_bin-0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
γ -shape_mcstat_ZZ_VR_obs_BDTG_bin_0	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00		土0.00	土0.00	土0.00	土0.00
$\alpha_Z Z Generator$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
α -syst ZZX sec	土0.00	土0.00	± 0.00	土0.00	± 0.00	土0.00	± 0.00		土0.00	± 0.00	土0.00	± 0.00
γ -shape-mestat- DY - VR -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat_tt_SK_obs_BUTG_bin_0	± 0.00	±0.00	±0.00	00 ₩	00.0 1 -	±0.00	±0.00	±0.00	10.0 1 1	± 0.00	00.00 +	00.0 1 -
γ_snape_mestat ## CR obs_DD1G_D1L_0 ~ shane mestat ## CR obs_BDTC hin 0			00.0H	8.0 H +			00.0H				00.0H	B 00 H +
\sim share mostat $WZ CR$ ohs BDTG hin 0	0000+	+0.00	+0.00	0.00+	0000+	+0.00	+0.00		000+	0000+	00.0+	0000+
γ -shape-mestat- DY - CR -obs- $BDTG$ -bin-0	+0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	+0.00
$\gamma_{\text{-shape-mcstat-}H-SR_obs_BDTG_bin_0}$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		±0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_ WW _ SR -obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- Wt - SR -obs- $BDTG$ -bin- 0	± 0.00	土0.00	±0.00	±0.00	±0.00	±0.00	土0.00		±0.00	土0.00	土0.00	±0.00
γ -shape-mcstat-Z-SR-obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ -shape_mcstat_WZ_SR_obs_BDTG_bin_0	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat_ttW + ttZ + ttW W -CK_obs_BD'1G_bin_0		±0.00	±0.00	00 ₩	00.0 1 -	±0.00	±0.00		00.0 ₩	± 0.00	00.00 +	00.0 1 -
γ -shape-mcstat_ttW + ttZ + ttW W_SK_obs_BDTG_bin_0	±0.00	±0.00	#0.00	±0.00	00.0 ₩	±0.00	±0.00		#0.00	± 0.00	±0.00	±0.00
γ-snape-mestat- <i>r akes-2 n</i> -obs-DD 1 G-DIn-0				8.0 H H	8 9 H H				8.0 H H			8 0 H H
γ-snape-mestat- <i>n</i> - <i>Oh</i> -Obs-DD1G-DD10 2 shana mestat DV SD she DDTC him 0				8.0 H H								
v shane mestat + Z SR ohs RDTC hin 0		00.0+	000+	8.0+	80.04	00.04	00.04		8.0	0000+		000
\sim shape mostat $WW CB$ obs BDTG bin 0	+0.00	00.01	0000 +0.00	00.0+	00.0	00.01	00.01 +		0.01	0000 + 0000	00.01 +0.00	0000+
γ -shape-mcstat- tZ_CR -obs-BDTG-bin-0	土0.00	土0.00	土0.00	±0.00	十0.00 1	土0.00	土0.00		±0.00	±0.00	±0.00	十0.00
γ -shape-mcstat- ZZ - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ZZ_CR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $Fakes-CR$ -obs-BDTG-bin-0	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape_mcstat_Z_CR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	±0.00	±0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00

Table 25: Breakdown of the dominant systematic uncertainties on background estimates in VR_2^{DF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Total hackeround evnectation												
Town prover outry of boundary	89.34	0.01	5.41	0.03	0.19	0.00	0.13	0.82	0.00	4.54	51.39	26.82
Total background error	± 19.00	土0.01	± 2.19	土0.03	土0.37	±0.00	±0.08	土0.24	土0.00	土4.75	土6.42	土17.17
γ -shape-mcstat- $Fakes$ - VR -obs-BDTG-bin-0	± 17.15	±0.00	土0.00	土0.00	±0.00	±0.00	±0.00	年0.00 10.00	±0.00	±0.00	±0.00	± 17.15
Jet energy scale	07.0H		H0.49	B 8	H 0.04			90.0H	6 0 0		ло: /Н	8 9 9
A eventing and a second	+			0000+		00.04		00.0+		000+		8.04
a ZGenerator	+4.52	0000+	000+	000+	000+	0000+	00.0+	00.0++	000+	+4.52	0000+	000+
α -ttGenPlusPS	± 3.97	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 3.97	±0.00
γ _shape_mcstat_ttr_VR_obs_BDTG_bin_0	± 2.20	± 0.00	土0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 2.20	± 0.00
ά-PileUp	± 1.60	± 0.00	± 0.60	± 0.00	± 0.02	± 0.00	± 0.00		± 0.00	± 0.30	± 0.69	± 0.00
γ -shape_mcstat_Wt_VR_obs_BDTG_bin_0	± 1.59	± 0.00	± 1.59	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
Jet energy resolution	± 1.43	± 0.00	± 0.59	± 0.01	± 0.02	± 0.00	± 0.01		± 0.00	± 0.46	± 1.43	± 0.00
CellOut energy scale	± 1.36	± 0.00	± 0.35	± 0.00	± 0.02	± 0.00	± 0.00	± 0.03	± 0.00	± 0.14	± 1.52	± 0.00
CellOut energy resolution	± 1.22	± 0.00	± 0.14	± 0.00	± 0.00	± 0.00	± 0.00	± 0.01	± 0.00	± 0.36	± 0.99	± 0.00
α -systWtXsec	± 1.07	± 0.00	± 1.07	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
Lumi	± 1.06	± 0.00	± 0.15	± 0.00	± 0.01	± 0.00	± 0.00		± 0.00	± 0.13	± 0.00	± 0.75
γ -shape-mcstat-Z-VR-obs-BDTG-bin-0	± 0.73	± 0.00		± 0.00	± 0.73	± 0.00	± 0.00					
α -systZXsec	± 0.68	± 0.00		± 0.00	± 0.68	± 0.00	± 0.00					
α JVF	± 0.56	± 0.00	± 0.00	± 0.03	± 0.53	± 0.00						
$\alpha_{-t\bar{t}}$ ISRFSR	± 0.55	± 0.00		± 0.00	± 0.00	± 0.55	± 0.00					
αWW Generator	± 0.36	± 0.00	± 0.00	± 0.00	± 0.36	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
α -systTplusXsec	± 0.18	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00					
γ -shape_mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW_VN_ch_obs_BDTG_bin_0$	± 0.08	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_ $WW_VR_obs_BDTG_bin_0$	± 0.08	±0.00	±0.00	±0.00	± 0.08	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
α -FakesSyst	± 0.08	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	± 0.08
γ _shape_mcstat_W Z_V R_obs_BD'I'G_bin_0	±0.07	±0.00	±0.00	±0.00	±0.00	±0.00	±0.07	±0.00	±0.00	±0.00	±0.00	±0.00
$\alpha_{-}W \ge 0$	±0.03	±0.00	00.0±	00.0 ₩	± 0.00	±0.00	±0.03	±0.00	± 0.00	00.0∏	±0.00	00.0 <u>∓</u>
ر میں Turveraten - V A_OUS_DU LO_UIILO	70.0H											
a system 77 Xeer	10.0+	00.0+	00.0+	8.04	10.01	00.0+	10.04	00.0+	000+	00.0+	00.04	000
a svsttZX sec	+0.01	+0.01	+0.00	+0.00	+0.00	+0.00	+0.00	00'0+	+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat- tZ - VR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-ZZ-VR-obs_BDTG-bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
$\alpha_Z Z Generator$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
α -syst ZZ sec	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $DY-VR_{obs}BDTG_{bin-0}$	± 0.00	±0.00	土0.00	±0.00	±0.00	±0.00	土0.00		±0.00	土0.00	± 0.00	±0.00
γ -shape_mcstat_tt_SR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00
γ_shape_mcstat_Wt_CR_obs_BD'I'G_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ-shape-mcstat-WZ-CK-obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		± 0.00	±0.00	±0.00	±0.00
γ-shape-mcstat-DY-CK-obs-BDTG-bin-U	±0.00	±0.00	±0.00	#0.00 #	± 0.00	±0.00	±0.00		± 0.00	±0.00	±0.00	0.0 ₩
γ-snape-mestat- <i>H</i> -zh-obs- <i>B</i> U1G-bIn-U	00.0 1 1 1 0 0 0 0	±0.00	±0.00	00.0 	± 0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	00.0 1 1
												0.04 H H
$\sim \text{share mestat } T CR \text{obs} RDTC hin 0$		00.0+		8.0		0000+	000+		0000+	000+	00.04	0000
v share mostat IV+ CR ohs RDTC hin 0				000+		+0.00	000+			000+		0.01+
relation more at a character of the RDTC him of												8.0
\sim share mestat WZ SR ohs RDTG hin 0		00.0+	00.04	8.04	000+	00.0+	000+		0000+	00.0+	00.04	00.04
\sim share most at $t\bar{t}W + t\bar{t}Z + t\bar{t}WW CR$ obs RDTG hin 0	00.0+	000+	000+	000+		000+	000+	00.0+	000+	000+	000+	000+
$\sim \text{share most at } \pm \overline{t}W \pm \pm \overline{t}Z \pm \pm \overline{t}WW $ SR ohs BDTG him 0			000+			000+	000+			000+	000+	8.04
Zenapermestat False SR of BDTC him 0				8.04					800+	00.0+	00.04	8.0 +
\sim share most at $H \cap R$ she RDTC hin 0				0000+		00.04		00.0+		000+	00.04	8.04
\sim share most at $DV SR$ obs BDTC hin 0	000+	000+	000+	000+		000+	000+	00.0+	800++	000+	000+	000+
\sim share most at tZ SR ohs BDTC hin 0	00.0+	+0.00	000+	000+	000+	000+	+0.00		000+	000+	000+	00.0+
\sim shape mostat $WW CR$ obs BDTG hin 0	00.0+	000+	000+	000+	000+	+0.00	000+		000+	000+	+0.00	0000+
\sim shape mostat ZZ SR obs BDTG hin 0	00.0+	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
\sim shape mostar ZZ CB obs BDTG hin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
γ shape mostat Fakes CR obs BDTG bin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00

Table 26: Breakdown of the dominant systematic uncertainties on background estimates in VR_2^{DF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

			147 +	Ξ	MM	NN	ZM	ttW + ttZ + ttWW	DY	N	tt	Fakes
Uncertainty of channel	VR_3^{DF}	tZ	1 AA		:			-				
Total background expectation	48.32	0.00	4.07	0.03	0.14	0.00	0.01	0.42	0.00	2.24	32.72	8.68
Total background error	± 13.02	±0.00	± 1.76	± 0.03	± 0.12	±0.00	± 0.01	± 0.15	±0.00	± 2.38	土7.72	± 9.29
γ -shape-mcstat- $Fakes-VR$ -obs-BDTG-bin-0	± 9.29	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 9.29
Jet energy scare	но. Н Ок		H0.94		H 0.04			10.00 10.00			H 4-01	B 8
v evettiver		8.0+				8.04	0000+		00.0+	00.0+		
v tFGen Plus PS	+2.63	000+	0000+	000+	00 00+	000+	0000+	00.0++	00.0+		+2.63	0000+
a ZGenerator	+2.24	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	00.01+	+0.00	+2.24	+0.00	+0.00
\sim shane mostar $t\bar{t}$ VB obs BDTG hin 0	+2.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0,00	+0.00		+2.00	+0.00
\sim shape mostat $Wt VR$ obs BDTG bin 0	+1.22	+0.00	+1.22	+0.00	+0.00	+0.00	+0.00	+0,00	+0.00		+0.00	+0.00
CellOut energy scale	+1.08	+0.00	+0.10	+0.00	+0.01	+0.00	+0.00	+0.04	+0.00		+0.89	+0.00
or svst W t X sec	+0.81	+0.00	+0.81	+0.00	+0.00	+0.00	+0.00	00'0+	+0.00		+0.00	+0.00
let energy resolution	70.74	8.04	+010	000+	+0.01	800+	000+	2000++	00 0+		10.60	
or bileIn	190+	8.0+	200+		10.01	800+	000+	000++	000+		00.04	
«Lincop « shana mrstat Z VR ohs RDTC hin O	+0.0+	8.0+			70.04		00.0+	70.0H	00.04	01-01+	67.0+	
γ	40.0H							10.01			00-0-1-	
	H0.44	00-0H-	TT-0 H	00.0H	00.0H	00-04-	00.0H	10.0H	00.0H		00-04-	H0.44
a_syst d A sec	±0.34	00.0 <u>∓</u>	± 0.00	±0.00	±0.00	00 1	±0.00	±0.00	±0.00		00 ₩	±0.00
α_J V F	±0.27	±0.00	±0.00	±0.00	±0.00	00.0 <u></u> #	±0.00	±0.00	±0.00		±0.27	#0.00
CellOut energy resolution	±0.11	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.05	±0.00		±0.06	±0.00
α -systTplusXsec	± 0.09	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	± 0.09	±0.00		±0.00	±0.00
$\alpha_{-}WW$ Generator	±0.08	±0.00	±0.00	±0.00	±0.08	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat-W W -V K_obs_BUTG-bin_0		±0.00	± 0.00	±0.00	±0.0±	±0.00	±0.00	±0.00	±0.00		± 0.00	±0.00
γ -shape-mcstat_ttW + ttZ + ttW W -V R_obs_BD'IG_bin_0		±0.00	± 0.00	±0.00	±0.00	±0.00	± 0.00	±0.06	±0.00		±0.00	±0.00
α	±0.03	00.0 1 1	00.0 1 1	00.0 1 1	00.0∏ +	00.0 ₩	00.0	±0.00	00.0	±0.00	00.0 ₩ +	±0.03
7-snape-mostat-n-V n-ous-DU tG-DIILO	70.0H			70.07 H 1		00.04 H H	H 0.00	00.0H			00.04 H H	
γ IN \mathcal{P} Convertor	10.04											
v svst W W Sec	+0.01	00.0+	+0.00	+0.00	+0.01	00.0+	+0.00	+0.00	+0.00		0.00+	00.0+
v svsttZXsec	00 0+	000+	+0.00	000+	10.00	000+	000+	00 0+	00.0+	00 0+	000+	000+
mil HTDF	00.0+	000+	+0.00	+0.00	+0.00	0000+	+0.00		+0.00		000+	000+
γ -shape-mcstat- tZ - VR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
a-syst W ZXsec	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
α -systZZXsec	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00
γ -shape-mcstat-ZZ_VR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00		± 0.00	土0.00
γ -shape-mcstat- DY - VR -obs-BDTG-bin-0	± 0.00	±0.00	± 0.00	土0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	± 0.00	±0.00	±0.00
$\alpha_z Z Z$ Generator	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00
γ -shape_mcstat_tt_SK_obs_BDTG_bin_0	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00		00.00 ₩	±0.00
γ -shape-mcstat- $W t_{-}C R_{-}$ obs_BDTG-bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00
γ -shape-mcstat_tt_CK_obs_BD'I'G_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00
γ -shape-mcstat-W Z-CK-obs-BDTG-bin-0	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00		00.00 ₩	±0.00
γ -shape-mcstat- DY - CR -obs- $BDTG$ -bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00
γ_shape_mcstat_H_SK_obs_BD'I'G_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ_shape_mcstat_W W_SK_obs_BD'IG_bin_0	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	± 0.00		±0.00		±0.00	±0.00
γ -shape-mcstat- W t-S R -obs-BDTG-bin-0	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	± 0.00		±0.00		± 0.00	±0.00
γ -shape-mcstat-Z-SR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00
γ -shape-mcstat- WZ -SR_obs_BDTG_bin_0	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00		±0.00	±0.00
γ -shape-mcstat_ttW + ttZ + ttW W_CR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00
γ -shape-mcstat_ttW + ttZ + ttWW_SR_obs_BDTG_bin_0	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	± 0.00	± 0.00	±0.00		±0.00	±0.00
γ -shape-mcstat- $Fakes$ - SR -obs-BDTG-bin-0	± 0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00
γ -shape-mcstat-H-CR_obs_BDTG_bin_0	± 0.00	±0.00	± 0.00	土0.00	±0.00	±0.00	± 0.00	±0.00	±0.00		±0.00	±0.00
γ -shape-mcstat_ DY _ $SR_obs_BDTG_bin_0$	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00
γ -shape-mcstat_ $tZ_SR_obs_BDTG_bin_0$	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00
γ -shape-mcstat- WW - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00		土0.00	± 0.00
γ -shape-mcstat- tZ - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-ZZ-SR-obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
γ -shape-mcstat_ZZ_CR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
γ -shape-mcstat_Fakes_CR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00
\sim shane moster Z <i>CB</i> ohe BDTC hin D	+0.00	+n 00							000			000

Table 27: Breakdown of the dominant systematic uncertainties on background estimates in VR_3^{DF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Total background expectation	,											
	39.00	0.00	4.08	0.03	0.14	0.00	0.01	0.42	0.00	2.25	23.39	8.68
Total background error	± 10.53	±0.00	± 1.76	± 0.03	± 0.11	±0.00	± 0.01	± 0.15	±0.00	± 2.36	土3.46	± 9.29
γ -shape-mcstat- $Fakes$ - VR_obs -BDTG_bin_0	± 9.29	±0.00	±0.00	±0.00	±0.00	0.00 + +0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 9.29
Jet energy scare	++ + 3 - 1 3		10.00	10.0H	+0.04						H 0.13	
W HISBESE	+3.70	8.04	0000+	000+	000+	0000+	0000+		00.0+	00.0+	+ 2.70	000
or svstttfXsec	+2.30	00.0+	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+2.30	+0.00
α Z Generator	+2.23	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	0000+	+0.00	+2.23	00.0+	+0.00
$\alpha_{-t} \bar{t} \bar{t} Gen Plus PS$	+1.87	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+1.87	+0.00
γ -shape-mcstat_tt_VR_obs_BDTG_bin_0	± 1.43	± 0.00	±0.00	±0.00	± 0.00	±0.00	± 0.00		± 0.00	± 0.00	± 1.43	±0.00
γ -shape-mcstat- $WtVR$ obs_BDTG_bin_0	± 1.22	± 0.00	± 1.22	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
CellOut energy scale	± 0.82	土0.00	± 0.10	± 0.00	± 0.01	土0.00	± 0.00		± 0.00		± 0.63	土0.00
α -syst $WtXsec$	± 0.81	± 0.00	± 0.81	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
Jet energy resolution	± 0.57	± 0.00	± 0.19	± 0.00	± 0.01	± 0.00	± 0.00		± 0.00		± 0.43	± 0.00
α -PileUp	± 0.55	± 0.00	± 0.07	± 0.00	± 0.02	± 0.00	± 0.00		± 0.00	± 0.24	± 0.21	± 0.00
γ -shape-mcstat-Z-VR-obs-BDTG-bin-0	± 0.52	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00		± 0.00	± 0.52	土0.00	土0.00
Lumi	土0.44	±0.00	± 0.11	±0.00	± 0.00	±0.00	± 0.00		±0.00	± 0.06	土0.00	± 0.24
α -systZXsec	± 0.33	#0.00	±0.00	00.01	±0.00	±0.00	±0.00		±0.00	± 0.33	±0.00	±0.00
α-JVF	± 0.19	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	± 0.19	±0.00
CellOut energy resolution	71.0 1 1	B.0 1 1	00.0 	00.0	00.0 ∏	00.0 ₩	00.0	10.00 10.00	00.01 ₩	11.01 11.01	±0.04	00.0 ₩
~ W.W.Generator	80.0+	8.0+	00.0+	000+	80.04		0000+		00.0+	00.0+	00.04	8.0
\sim shape mostat $WW VB$ ohs BDTG hin 0	+0.07	00.0+	+0.00	+0.00	+0.07	+0.00	+0.00		+0.00	+0.00	+0.00	0000+
γ _shape_mcstat_t $\overline{t}W + t\overline{t}Z + t\overline{t}WWVR_obs_BDTG_bin_0$	±0.06	±0.00	+0.00	+0.00	± 0.00	+0.00	± 0.00		± 0.00	± 0.00	+0.00	±0.00
α -FakesSyst	± 0.03	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.03
γ -shape-mcstat- $H_VR_obs_BDTG_bin_0$	± 0.02	± 0.00	± 0.00	± 0.02	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
γ -shape-mcstat- $WZ-VR$ -obs-BDTG-bin-0	± 0.01	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.01		±0.00	±0.00	十0.00	±0.00
α_W Z Generator	±0.01	n	± 0.00	±0.00	±0.00	00.0∏ -	±0.01		±0.00	±0.00	00.0 1 1	00.0 1 1
a_systWWXsec	±0.01	00.0 <u>1</u>	±0.00	00.0∏	±0.01	00.0 ₩	00.0		±0.00	±0.00	00.0 1 1 1	00.0 ₩
α -system metric 47 VD of BDTC bin D	00.01 1	B.0 1 1	00.0 	00.0	00.0 ∏	00.0 ₩	00.0	0000+	00.01 ₩		00.04 H H	00.0 ₩
	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00		+0.00	+0.00
α -systZZXsec	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
γ -shape-mcstat- DY - VR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
γ -shape-mcstat-ZZ-VR-obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
$\alpha_Z Z Generator$	土0.00	±0.00	±0.00	土0.00	土0.00	土0.00	±0.00	土0.00	土0.00	土0.00	土0.00	土0.00
γ -shape-mcstat_tt_SR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ -shape_mcstat_W t_C K_obs_BD'I'G_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ-snape-mcstat-W Z-CK-obs-BUIG-pin-0	00.01 +0000	00.0 1 1	00.0 1 1	00.0	00.0 1 1	00.0 1 1	00.0 1 1 1 0 0 0 0 1	±0.00	00.01 1	00.0 1 1 1 0 0 0 1	00.0 ₩ +	00.0 1 1
γ share meetst H CR she RDTC him D	00.0+			00.04								8.0
γ shape mostat $t\bar{t}$ <i>CR</i> obs BDTG hin 0		8.0	0000+	0000+	00.04	00.04	0000+		00.0+		00.04	00.0+
γ -shape-mcstat_WW_SR_obs_BDTG_bin_0	+0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00		±0.00		±0.00	±0.00
γ -shape-mcstat- tZ - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
γ -shape-mcstat- $Wt_SR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ZSR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
γ -shape-mcstat- WZ - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
γ -shape_mcstat_ $tW + ttZ + ttWW_CR_obs_BDTG_bin_0$	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00		±0.00		十0.00	±0.00
γ -shape-mcstat_ttW + ttZ + ttWW_SR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00		±0.00		±0.00	±0.00
γ_shape_mcstat_ <i>Fakes_SK_</i> obs_BD'IG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	± 0.00	±0.00
γ -snape-mestat-H-CK-obs-BDTC -Din-U	00.0 1 1 0 0 0 0 1	00.0 1 1 1	±0.00	00.0∏	±0.00	00.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	± 0.00	±0.00	±0.00	±0.00	00.01 1	00.0H
7-snape-mostat-D1 -2.A-008-DD 1 G-DM-0												8.0 H H
\sim share mostat WW CR obs BDTG him 0	00.0+	8.0	0000+	000+	00.0+	00.04	000+		00.0+		00.04	000
\sim shape mostat ZZ SR obs BDTG hin 0	00.0+	0000+	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00		0000+	00.04
γ -shape-mestat- ZZ_CR -obs-BDTG-bin-0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00		+0.00	+0.00
	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	± 0.00		± 0.00		±0.00	±0.00
γ -shape-mcstat-Z-CR_obs_BDTG_bin_0	+0.00	00 0+										

Table 28: Breakdown of the dominant systematic uncertainties on background estimates in VR_3^{DF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Uncertainty of channel	VR_4^{DF}	tΖ	1 11		11 11	2	7 7	ttW + ttZ + ttWW	1	4	11	enver.
Total background expectation	919.53	0.16	55.39	1.72	60.22	0.11	3.92	9.48	0.00	33.49	755.03	0.00
Total background error	± 291.33	± 0.17	± 13.98	± 0.28	± 13.11	± 0.09	± 1.95	± 2.24	土0.00	± 19.98	± 283.19	±0.00
$\alpha_{-t}\overline{t}$ ISRFSR	± 246.11	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 246.11	± 0.00
Jet energy scale	± 106.52		± 5.98	± 0.19	± 4.95	± 0.01	± 0.23	± 0.62	±0.00	± 5.01	± 89.51	00.01
a_systttXsec	± 75.50	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 75.50	±0.00
α_ttGenerator	103.00 128.14	±0.00	± 0.00	00.01 ₩	00.0 1 1	00.01 H	00.0 1 0	100.00	00.0H	± 0.00	1203-00	B.0 ₩
Jet efferty resolution	H 30 20		80-1 H H				10.00 10.01	00.0H		17.0H	130.30 130.90	
ctrister	+ 27.50	00.04	+1.66	+0.05	0.01 1 8 1		+0.10 13	10.00 10.08	00.04	H - 00	+22.020	0.0 H +
CellOut energy scale	+19.20	+0.00	+0.22	+0.05	+0.39	+0.00	+0.04	+0.04	+0.00	+0.20	+18.70	+0.00
or Z Generator	+18.29	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+18.29	+0.00	+0.00
$\alpha W W$ Generator	± 11.35	±0.00	+0.00 +	±0.00	± 11.35	±0.00	±0.00	+0.00	±0.00	+0.00	±0.00	+0.00 +
$\alpha_{\rm syst}Wt {\rm Xsec}$	± 11.08	± 0.00	± 11.08	± 0.00	± 0.00	± 0.00	+0.00	±0.00	± 0.00	± 0.00	±0.00	+0.00
γ -shape-mcstat- $t\bar{t}$ - VR -obs-BDTG-bin-0	± 9.99	±0.00	土0.00	± 0.00	土0.00	± 0.00	土0.00	±0.00	土0.00	土0.00	± 9.99	土0.00
a_PileUp	± 6.20	± 0.01	± 1.99	± 0.06	± 0.65	± 0.00	土0.07	± 0.12	± 0.00	± 0.44	± 5.41	± 0.00
CellOut energy resolution	± 6.09	± 0.00	± 0.60	± 0.03	± 0.34	± 0.00	± 0.09	± 0.01	± 0.00	± 0.44	± 5.78	± 0.00
$\alpha_{-}JVF$	± 5.58	土0.00	± 0.36	± 0.02	± 0.90	± 0.00	± 0.03	± 0.01	土0.00	± 0.39	± 3.87	±0.00
α -systZXsec	± 5.02	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	± 5.02	±0.00	±0.00
γ _shape_mcstat_W t_V R_obs_BD'I'G_bin_0	± 4.98	±0.00	± 4.98	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
Lumi	±4.61	00.0	11.55 14	¢0.0±	±1.69	± 0.00	±0.11	±0.27	±0.00	± 0.94	00.00 +0.00	00.0 H +
a stot The Asec	10.01 H H		8 0 H H					00.0H			00.00 H H	
W Z Generator	++	+0.00	00.0+	+0.00	+0.00	+0.00	+1.85	00.01+	+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat- $WW-VR$ -obs-BDTG-bin-0	± 1.38	±0.00	土0.00	±0.00	± 1.38	土0.00	+0.00	±0.00	土0.00	±0.00	±0.00	土0.00
$\gamma_{\rm shape-mcstat-Z-VR_obs_BDTG_bin_0}$	± 1.29	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 1.29	± 0.00	土0.00
	± 0.41	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.41	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $t\bar{t}W + t\bar{t}Z + t\bar{t}WW$ -VR-obs-BDTG-bin-0	± 0.28	土0.00	土0.00	± 0.00	土0.00	± 0.00	土0.00	± 0.28	土0.00	土0.00	土0.00	土0.00
α -syst WZX sec	± 0.27	土0.00	±0.00	十0.00	±0.00	±0.00	± 0.27	±0.00	±0.00	±0.00	±0.00	±0.00
α systt Δ sec	01.0±	a1.0±	00.0 ∏	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	00.0
γ -snape-mcstat- H_V R_{ODS-BU} I G-DIN-U	01.0 1	00.0	0.0 ₩	01.0±	00.0∏ +	±0.00	00.0 1 1 1 0 0 1	10.00 +0.000	00.0	00.0 1 1 1 0 0 0 1	00.00 +0	00.0 ₩ +
α_Z Z Generator mii <i>t</i> r̀DF	80.0 H +	00.0H	00.0 H +	00.0H	00.04	90.00 H +	00.0H	00.01 +0.00	00.0H	0000 H +	00.0H	8.0 H +
\sim -shape-mcstat-ZZ-VR-obs-BDTG-bin-0	+0.04	+0.00	+0.00	+0.00	+0.00	+0.04	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat- tZ - VR -obs-BDTG-bin-0	± 0.02	± 0.02	土0.00	土0.00	土0.00	土0.00	土0.00	±0.00	土0.00	土0.00	土0.00	土0.00
α -syst ZZXsec	± 0.01	± 0.00	± 0.00	± 0.00	± 0.00	± 0.01	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- DY - VR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $Fakes-VR_{obs}BDTG_{bin_0}$	± 0.00	土0.00	土0.00	± 0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00
γ -shape-mcstat_tt_SR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ_snape_mestat_W t_C K_obs_BDTG_pin_0	10.00 1	00.0 1 1 1 0 0 0 1	00.0 1 1	00.01 +0	00.0∏	00.00 + +	00.0 1 1 0 0 1	10.00 +0.000	00.0∏	00.01 1 −	00.00 +0.00	00.0 ₩ +
~ shape mostat WZ CR oke RDTG bin 0		00.0+	0.04	00.0+	000+	0000+	00.0+	00.01+	00.0+	000+	00.0+	000+
\sim shane mostat DV CR obs BDTC hin 0		000+	0.0+	00.0+	000+	0000+	00.0+	00.0+	00.0+	000+	00.0+	000+
γ -shape-mestat- H - SR_{obs} - $BDTG_{bin}$ - 0	± 0.00	+0.00	+0.00	± 0.00	+0.00	± 0.00	± 0.00	+0.00	± 0.00	± 0.00	+0.00	+0.00
γ -shape-mcstat- $WW_SR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- Wt -SR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-Z-SR-obs-BDTG-bin-0	±0.00	± 0.00	±0.00	± 0.00	±0.00	± 0.00	± 0.00	十0.00	± 0.00	土0.00	± 0.00	±0.00
α -FakesSyst	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ_shape_mcstat_WZ_SR_obs_BDTG_bin_0	±0.00	±0.00	00.00 ₩	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
$\gamma_{\text{shape}} = \max_{\text{state}} ttW + ttZ + ttW W - CK_{\text{obs}} = DTG_{\text{bin}} = 0$	10.00	00.0∏ +	00.0 1 1	00.01 +0	00.0∏	00.00 ₩	00.0 1 1 1 0 0 1	10.00 +0.000	00.0∏	00.01 +	00.00 +0.00	00.0 ₩ +
γ_snape_mcstat_ <i>lt W</i> + <i>tt Δ</i> + <i>tt W</i> W _ <i>D</i> M_008_DD 1 G_011_0			8.0 H H								00.01 H	
7-Shape-Intstater ares. D. 1005. D. 1 G-0111-0 2 share mostat H CR ohs RDTC him 0	10.00 +	00.0H	8.0 H +	00.0H						00-0 H +	0.00	8.0 H +
\sim shape mostat DV SR obs BDTC bin 0		000+	0000+	000+	000+	000+	000+	00.0+	000+	000+	00.0+	000+
\sim shape mostat $_{TZ}$ $_{SR}$ obs BDTG-bin $_{0}$	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat- WW - CR -obs-BDTG-bin-0	±0.00	±0.00	十0.00	± 0.00	土0.00	土0.00	±0.00	±0.00	土0.00	± 0.00	±0.00	土0.00
γ -shape-mcstat- tZ - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-ZZ-SR-obs-BDTG-bin-0	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00
γ -shape-mcstat_ZZ_CR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $Fakes$ - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_Z_CR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	+0.00	±0.00

Table 29: Breakdown of the dominant systematic uncertainties on background estimates in VR_4^{DF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Uncertainty of channel	$V R_4^{-1}$	2	2				1	11 11 + 117 + 117 11	1	٩	2	
Total background expectation	850.99	0.16	55.39	1.72	60.22	0.11	3.92	9.48	0.00	33.49	686.50	0.00
Total background error	± 219.10	± 0.17	± 13.90	± 0.28	± 13.03	± 0.09	± 1.93	± 2.23	±0.00	± 19.85	± 215.66	±0.00
$\alpha_{-t}\overline{t}$ ISRFSR	± 212.13	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 212.13	± 0.00
mu_ttDF	± 114.58	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	± 114.58	±0.00
Jet energy scale	± 97.98	±0.01	± 5.95	± 0.19	± 4.93	+0.01	± 0.23		±0.00	± 4.99	± 81.06	±0.00
	108.20 + 10 17	00.01 1	00.0 1 1	00.0∏ +	00.0∏ 	00.01 ₩	100.01 1		00.0 1 1 1 0 0 1	10.00 1 +	108.20 11.00 11.00	00.0 ₩
a_ucenterator Tot onormy resolution	140.47 +31.06		H 0.00	00.0H			100.00	00.0H 81.0H		H 2 10	140.41 + 20 80	
oet energy resolution or tipartonShower	+27.28	10.01	70-04 +	C0.01	00.0H	00.0 +	+0.00		00.0+	+0.00	+27.28	00.04
artiger	+25.36	+0.00	+1.65	+0.05	+1.79	+0.00	+0.12		+0.00	+1.00	+20.46	+0.00
$\alpha_z Z$ Generator	± 18.17	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 18.17	± 0.00	± 0.00
CellOut energy scale	± 17.41	± 0.00	± 0.22	± 0.05	± 0.39	± 0.00	± 0.04		± 0.00	± 0.20	± 16.91	± 0.00
α -WWGenerator	± 11.27	± 0.00	± 0.00	± 0.00	± 11.27	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
α -syst $WtXsec$	± 11.00	± 0.00	± 11.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_tt¯_VR_obs_BDTG_bin_0	± 9.08	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 9.08	± 0.00
α -PileUp	± 5.67	± 0.01	± 1.98	± 0.06	± 0.65	± 0.00	± 0.07		± 0.00	± 0.43	± 4.89	土0.00
CellOut energy resolution	± 5.53	± 0.00	± 0.59	± 0.03	± 0.34	± 0.00	± 0.08		± 0.00	土0.44	± 5.22	土0.00
α -JVF	± 5.20	±0.00	± 0.36	± 0.02	± 0.89	± 0.00	± 0.03		±0.00	± 0.39	± 3.50	±0.00
a_systZAsec	± 4.99	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	± 4.99	±0.00	±0.00
γ -shape-mcstat_W t_V K_obs_BD'I'G_bin_0	±4.98	±0.00	± 4.98	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
A syst W/W Year	4.00 00 00				00 6+			07.04	00.0+		00.01 +	
assetThus See	+2.07	00.0+	0000+	00.04	00 0+	0000+	00.0+		00.0+	00.0 +	00.0+	0000+
$\alpha_W Z$ Generator	± 1.84	+0.00	±0.00	土0.00	土0.00	+0.00	± 1.84		±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- WW_VR_obs -BDTG-bin-0	± 1.38	± 0.00	± 0.00	± 0.00	± 1.38	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-Z-VR-obs-BDTG-bin-0	± 1.29	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 1.29	± 0.00	± 0.00
γ -shape-mcstat- $WZ-VR_{obs}$ -BDTG-bin-0	± 0.41	土0.00	± 0.00	土0.00	土0.00	± 0.00	± 0.41		± 0.00	土0.00	± 0.00	土0.00
γ -shape-mcstat- $ttW + ttZ + ttWW$ -VR-obs-BDTG-bin-0	± 0.28	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00 ±	±0.00
α_systW ZASec	10.27	±0.00 16				00.0	77.0H		00.04	00.0H	00.0H	
γ -shape-mcstat HVR obs_BDTG_bin_0	± 0.16	± 0.00	+0.00	± 0.16	+0.00	± 0.00	± 0.00		± 0.00	± 0.00	+0.00	± 0.00
$\alpha_z Z Z$ Generator	± 0.08	+0.00	+0.00	±0.00	±0.00	± 0.08	土0.00		+0.00	±0.00	±0.00	+0.00
γ -shape-mcstat-ZZ-VR-obs-BDTG-bin-0	± 0.04	± 0.00	± 0.00	± 0.00	± 0.00	± 0.04	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ $tZ_VR_obs_BDTG_bin_0$	± 0.02	± 0.02	± 0.00	土0.00	土0.00	± 0.00	土0.00		± 0.00	土0.00	± 0.00	土0.00
α -systZZXsec	± 0.01	±0.00	±0.00	±0.00	±0.00	± 0.01	±0.00		±0.00	±0.00	±0.00	±0.00
γ -shape-mostat- $DY - VR_{obs}-BDTG-bin-0$	±0.00	±0.00	±0.00	±0.00	#0.00	# 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -snape-mestat $_{L}Fakes_V K$ -obs_DUIG-DIILU \sim share mestat $t\overline{t} SR$ obs RDTC bin 0	00.01 +0.00	00.0 1 1	00.0 H +	00.0 1 1 00.0 1 1	00.0H	00.0 +	00.0H		00.0 1 1	00.0 H	00.0H	00.0 H +
γ shape mestat $Wt CR$ obs BDTG bin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat- WZ - CR -obs-BDTG-bin-0	土0.00	土0.00	土0.00	土0.00	土0.00	± 0.00	土0.00		± 0.00	土0.00	±0.00	土0.00
γ -shape-mcstat- DY - CR -obs- $BDTG$ -bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_H_SR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat_tt_CK_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	#0.00	# 0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ_snape_mcstat_W W _J K_OBS_BU I G_DIN_U	00.01 +0.00	00.0 1 1 1				00.0			00.04	00.0H	00.0H	
\sim share mostat $W + SR$ ohe BDTC bin 0		000+	000	00.04	00.0+	000+	00.0+		00.0+	00.0+		000++
\sim shape mostat Z SR obs BDTG hin 0	00.0+	00.0+	00.01+	+0.00	00.01 +	0.00+	+0.00		+0.00	+0.00	00.0+	00.01+
α -FakesSyst	±0.00	±0.00	±0.00	±0.00	土0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ -shape_mcstat_ $WZ_SR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW_CR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW_SR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $Fakes$ - SR -obs-BDTG-bin-0	±0.00	± 0.00	± 0.00	土0.00	土0.00	± 0.00	土0.00		± 0.00	土0.00	± 0.00	土0.00
γ -shape_mcstat_H_CR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	±0.00	±0.00	± 0.00	±0.00		± 0.00	±0.00	± 0.00	±0.00
γ-shape-mcstat-DY_SR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ_shape_mcstat_tZ_SK_obs_BD'I'G_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ_shape_mestat_W V_CK_obs_BUTG_bin_0	00.00 + +	00.0∏ +	00.04 1	00.01 +	00.0∏ +	± 0.00	100.01 1	±0.00	00.01 1	00.01 +	00.01 +0.00	00.01 1
γ -shape-incertate ZZ CR observation 0	00.0+	00.04	00.0H		00.0H	00.0H	00.0H		00.0H	00.0H	00.0H	000 H +
γ -shape-mestat- $Fakes$ CR -obs-BDTG-bin-0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
\sim shape mostat Z CB obs BDTG hin 0	± 0.00	± 0.00	+0.00	+0.00	+0.00	+000	+0.00	+0,00	00 0+			00 0+

Table 30: Breakdown of the dominant systematic uncertainties on background estimates in VR_4^{DF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Uncertainty of channel	VH_5	tz	Wt		11 11	2	7	ttW + ttZ + ttWW	1	1	2	
Total background expectation	139.08	0.04	8.51	0.14	9.71	0.02	0.41	1.72	0.00	0.25	118.28	0.00
Total background error	±29.06	土0.04	± 3.89	± 0.06	± 2.04	± 0.02	± 0.53	± 0.41	±0.00	± 0.26	± 27.19	土0.00
α -ttGenerator	± 16.94	±0.00	±0.00	±0.00	±0.00	十0.00	十0.00	±0.00	±0.00	±0.00	± 16.94	±0.00
α -syst tt Sec	± 11.83	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00
CellOut energy scale	±10.20	00.0 1 1 0	±0.04 ±1 00	10.0 1 0 0 +	±0.250	00.0	00.0 1 1 0	10.00 10.07	00.0	T0.01		0.0 ₩ +
Jet energy resolution	107-01T		1 01 1 01	10.01	10.16	0.01 1001	40.03	10.03 +0.03	00.0+		1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	8.0
$\sim t\bar{t}PartonShower$					0000+		000+	00.0+	000+	000+		8.0+
a trigger	+4 17	00.0+		000+	00.04	000+	0.0+	10.05	000+	10.04	++ 	8.0++
\sim shane mostat $t\bar{t}$ VR obs BDTG hin 0	+3.84	+0.00	00.04	+0.00	+0.00	+0.00	+0.00	10000	+0.00	+0.00		00.00+
CellOut energy resolution	+3.49	+0.00	+0.58	+0.02	+0.14	+0.00	+0.01	+0.01	+0.00	+0.02		0.00+
o tilsbes	+2.92	000+	8.00	+0.00	+0.00	+0.00	+0.00	10.00	+0.00	+0.00	+2.92	0000+
\sim shape mostat W t V R obs BDTG hin 0	+1.99	+0.00	+1.99	+0.00	+0.00	+0.00	+0.00	10000	+0.00	+0.00		00.00+
αWW Generator	+1.76	+0.00	+0.00	+0.00	+1.76	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00
a sust W + Y sec	+1 70						800++	0000+	000+		0000++	80
	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	000+	900+	000+	+0.40	000+	000++	0000+	000+	000+	+1.20	8.0+
Let energy scale	+1.30	000+	+0.52	+0.02	+0.15	000+	000++	+0.01	000+	+0.01	+	8.04
Lumi	+0.58 82 0+	00.0+	+0.94	000+	+0.27	0000+	10.04	+0.05	+0.00	+0.01	1000	0000+
\sim shape mostat $WW VR$ obs BDTG hin 0	+0.54	+0.00	10.0+	+0.00	+0.54	+0.00	+0.00	+0.00	+0.00	+0.00	00.0+	00.0+
•	+0.50	+0.00	+0.00	+0.00	+0.00	+0.00	+0.50	+0.00	+0.00	+0.00	00.04	+0.00
$\alpha_{ m syst}WW{ m Xsec}$	± 0.49	± 0.00	± 0.00	± 0.00	± 0.49	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00
α -systTplusXsec	± 0.38	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00		±0.00
$\alpha_{-}Z$ Generator	± 0.25	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.25		土0.00
	± 0.14	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.14	± 0.00	± 0.00	± 0.00		± 0.00
γ -shape-mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WWVR_obs_BDTG_bin_0$	± 0.12	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.12	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $H_VR_{obs}BDTG_{bin-0}$	± 0.05	± 0.00	± 0.00	± 0.05	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		±0.00
γ -shape-mcstat-Z-VR-obs-BDTG-bin-0	± 0.05	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.05	± 0.00	±0.00
α -systtZXsec	± 0.04	± 0.04	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
α_syst Z X sec	±0.04	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.04	±0.00	± 0.00
α_syst W Z X sec	±0.03	00.0∏	00.0 ₩	± 0.00	±0.00	±0.00	±0.03	±0.00	±0.00	±0.00		0.0 1 -
7_shape_mcstat_ZZ_V R_obs_BDTG_bin_U	±0.02	±0.01	00.0 ₩	± 0.00	±0.00	±0.02	00.0 ₩	±0.00	#0.00	±0.00	00.0 ₩	00.0 ₩
$\gamma = 11 \alpha P$	10.04						0.04					0.04
v ZZGenerator	+0.01	00.0+	8.0	000+	00.0+	+0.01	0.0	00.0+	000+	000+		8.0
or svst ZZXsec	+0.00	+0.00	00.01+	+0.00	00.01	+0.00	00.01+	00.00+	+0.00	+0.00		00.00+
\sim shape mostat DY VR obs BDTG bin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
	±0.00	+0.00	±0.00	土0.00	+0.00	±0.00	±0.00	±0.00	+0.00	+0.00	±0.00	±0.00
$\gamma_{\rm shape-mcstat_t\bar{t}_SR_obs_BDTG_bin_0}$	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		土0.00
γ -shape-mcstat- Wt - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ $t\bar{t}$ _ CR _obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00		± 0.00
γ -shape-mcstat- WZ - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ DY _ $CR_obs_BDTG_bin_0$	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	±0.00	土0.00	±0.00	± 0.00	±0.00
7_shape_mcstat_H_SR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00
γ -shape-mostat-W W _D K_ODS-DU LG-DIILO	00.0H	n	00.0 H -	00.0 H -	00.0∏	00.0∏	00.0 H -	±0.00	nn.n −	00.0H	00.0H	00.0 1 -
γ -shape-mcstat-W t_J K_ODS_D U G_DIN_U	00.04 H		0.0 H +	00.0 H H			B 0	10.00	00.0H			B 0
7-suape-micstat-2-2 n-008-DD 1 G-0111-0 ~ Follos Syst	00.01 H		8 0 H +			00.0H	B 0 H +		00.0H	00.0H		8 0 H +
\sim shape mostat $WZSR$ ohs BDTC hin 0	00.0+	00.0+	8.0	0000+	00.04	000+	0.0	00.0++	000+	000+		8.0++
\sim shane mostat $t\bar{t}W + t\bar{t}Z + t\bar{t}WW \ CR$ obs BDTG bin 0	+0.00	000+	000++	+0.00	+0.00	+0.00	0.00+	10000	+0.00	+0.00		0000+
\sim shape mostat $t\overline{t}W + t\overline{t}Z + t\overline{t}WW SR$ obs BDTG bin 0	00.0+	0000+	0000+	000+	+0.00	0000+	00.0+	+0.00	+0.00	000+	00.0+	0000+
\sim shape mostat <i>Fakes SR</i> obs BDTG bin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat- <i>H</i> - <i>CR</i> -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	±0.00
$\gamma_{\rm shape-mcstat-DY-SR_obs-BDTG-bin-0}$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00
γ -shape-mcstat_tZ_SR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00		± 0.00
γ -shape-mcstat_WW_CR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- tZ - CR -obs-BDTG-bin-0	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00
γ -shape-mcstat-ZZ-SR-obs-BDTG-bin-0	土0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	土0.00	±0.00	±0.00	±0.00	±0.00
γ_shape_mcstat_ZZ_CR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00
γ -shape-mcstat- <i>Fakes-UR_</i> obs_BDTG_bin_0 \sim shape mcstat Z <i>CR</i> obs_BDTG_bin_0	00.0 +	00.0 +	0.0 ₩	00.01 +	00.0 +	00.0 + 00 0 0 0 0 0 0 0 0 0 0 0 0	8.0 # +	±0.00 +0.00	00.0#	00.01 +000	00.0 ₩	0.00 H H
A-TITA-D T AA-SARA-TT O- 7-101SOIIT-AABIS-J.	22.20 H		22.2									

Table 31: Breakdown of the dominant systematic uncertainties on background estimates in VR_5^{DF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

$ \ \ \ \ \ \ \ \ \ \ \ \ \ $		$v n_5$	tZ	Wt	Ц	MM	77	ZM	ttW + ttZ + ttWW	лı	1	2	
4:18.32 -0.04 -3.87 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 -0.03 <	Total background expectation	159.46	0.04		0.14		0.02	0.41	1.72		0.26	138.65	0.00
$ \label{eq:product} \mathbf{M} = \frac{1}{12} \mathbf{M} = \frac$	Total background error	± 18.82	土0.04	(m)	± 0.06	± 2.02	± 0.02	± 0.53	± 0.41	±0.00	± 0.26	± 17.56	± 0.00
eq:constraints for the second seco	$mu_t\bar{t}DF$	± 24.08	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 24.08	± 0.00
$ \label{eq:product} \mathbf{M} = \left\{ \begin{array}{cccccccccccccccccccccccccccccccccccc$	α_{-tt} Generator	± 19.74	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 19.74	±0.00
$ \label{eq:points} \begin{tabular}{lllllllllllllllllllllllllllllllllll$	α_systttAsec	± 13.79	±0.00	H -	±0.00	±0.00	±0.00	00 ₩ -	±0.00	±0.00	±0.00	±13.79	±0.00
$ \label{eq:product} \math transform the label{eq:product} \math tran$	CeliQut energy scale	H10.40		H 0.04	то о Н Н	67.0H		00.04	10.00 H H			70.71T	00-04 H H
	Jet energy resolution			200 F T		07.0T	0.04	40.03	+0.03			+ 9.01 + 8.33	
	or tiPartonShower	+5.51	00.0+	00.0+	10.01	01.04	10.01	800+	++0.00	000+	00.04	+5.51	800++
	α -trigger	+4.75	+0.00	+0.25	+0.00	+0.29	+0.00	+0.01	+0.05	+0.00	+0.01	+4.13	+0.00
	\sim shane mostat $t\bar{t}$ VR obs BDTG bin 0	+4.50	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+4.50	+0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	CellOut energy resolution	± 3.99	±0.00	± 0.57	± 0.02	± 0.14	±0.00	± 0.01	±0.01	±0.00	± 0.02	± 3.53	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\alpha_{-t\bar{t}}$ ISRFSR	± 2.01	± 0.00	+0.00	+0.00	±0.00	± 0.00	± 0.00	±0.00	+0.00	± 0.00	± 2.01	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- $Wt_VR_obs_BDTG_bin_0$	± 1.99	± 0.00	± 1.99	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
$D_{a} BDTGLhh, 0 = 11, 75 = 1000 \pm 10, 01 = 11, 75 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10, 00 = 10$	α _JVF	± 1.88	± 0.00	± 0.06	± 0.00	± 0.40	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 1.42	± 0.00
$ \begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	αWW Generator	± 1.75	± 0.00	± 0.00	± 0.00	± 1.75	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	α -syst Wt Sec	± 1.69	± 0.00	± 1.69	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Jet energy scale	± 1.64	± 0.00	± 0.57	± 0.02	± 0.15	± 0.00	± 0.00	± 0.01	± 0.00	± 0.01	± 2.35	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Lumi	± 0.58	± 0.00	± 0.24	± 0.00	± 0.27	± 0.00	± 0.01	± 0.05	± 0.00	± 0.01	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		± 0.54	± 0.00	± 0.00	± 0.00	± 0.54	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	α -WZ Generator	± 0.50	±0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.50	土0.00	±0.00	±0.00	±0.00	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	α -syst W W Xsec	± 0.48	±0.00	±0.00	±0.00	± 0.48	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
	α -syst I plus X sec	±0.38	±0.00	0.0 ₩	±0.00	±0.00	±0.00	00.0 ₩	±0.38	±0.00	±0.00	00.0∏	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		±0.25 10.4	±0.00	0.01 + -	± 0.00	±0.00	±0.00	00.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	±0.00	#0.00	± 0.25	00.0 1 1 1 0 0 0 0 0	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	ہ c	H0.12			00.0 H +		00-0+	H 0.14	H 0 10	00.0H		00.0 H +	8 0 H H
District Enoid Enoid <thenoid< th=""> Enoid Enoid <</thenoid<>	2	+0.05	+0.00	0.00+	+0.05	+0.00	00.01+	0.00+	10.00	+0.00	00.0+	0000+	0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat-Z-VR-obs-BDTG-bin-0	± 0.05	十0.00	十0.00	±0.00	±0.00	±0.00	十0.00	±0.00	±0.00	± 0.05	±0.00	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	α systtZXsec	± 0.04	± 0.04	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	α -systZXsec	± 0.04	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.04	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	α -systWZXsec	± 0.03	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.03	十0.00	±0.00	±0.00	±0.00	土0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ_shape_mcstat_ZZ_VK_obs_BD'IG_bin_0	±0.02	#0.00	0.0 1 1	± 0.00	±0.00	±0.02	00.0 ₩	±0.00	#0.00	±0.00	00.0 1 1 1 0 0 0 0 0	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	7_STAPE-INCSUAL-IZ-V A-ODS-DU I G-DIN-U	10.01 +	10.01 H +		00.0 H +		0.0H 10	B 0 H +		00.0H	00.0H	0.00	8 9 H +
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	or syst ZZXsec	00.0+	+0.00	00.01+	+0.00	00.01	+0.00	00.01+	+0.00	+0.00	+0.00	00.0+	0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ shape_mestat_ $Fakes_VR_obs_BDTG_bin_0$	+0.00	+0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	+0.00	± 0.00	± 0.00	+0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat_ $t\bar{t}$ _ $SR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{c} 10.00 & \pm 0.00 & \pm 0.0$	γ -shape_mcstat_ $Wt_CR_obs_BDTG_bin_0$	土0.00	± 0.00	土0.00	± 0.00	土0.00	土0.00	十0.00	土0.00	土0.00	土0.00	± 0.00	土0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- WZ - CR -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	十0.00	十0.00	±0.00	±0.00	±0.00	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- DY - CR -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mestat- <i>H</i> - <i>SK</i> -obs- <i>BD</i> I G-bin-0	00.00 ₩	00.01 ₩	00.0 1 1	00.01 + 0.00	00.0∏	00.04 1	00.0 ₩	10000 1	00.04 +	00.0±	00.01 H	0.0 1 1
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$			00.01	00.0+	+0.00	0000+	+0.00	00.0+	++0.00	+0.00	+0.00	0000+	00.0+
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	±0.00	土0.00	土0.00	±0.00	土0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat- Wt - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat_Z_SR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$		± 0.00	± 0.00	土0.00	± 0.00	土0.00	± 0.00	土0.00	±0.00	± 0.00	± 0.00	土0.00	土0.00
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat-WZ-SR-obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat_ttW + ttZ + ttW W_CR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape_incstate $ii i v + i i Z + i i W V - Z \Lambda_{0} 0 S_{D} J G_{0} III_{0}$			8 8 6 4				8 0 H H				00.0 H H	
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	γ shape mostat $H \subset R$ obs BDTG bin 0	0000+	00.0+	00.0+	0000+	00.0+	00.0+	00.0+	00.0++	0000+	00.01 +	00.0+	800
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	γ shape mostat $DY - SR_{obs}$ BDTG bin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat_tZ_SR_obs_BDTG_bin_0	±0.00	十0.00	十0.00	±0.00	±0.00	±0.00	十0.00	±0.00	±0.00	土0.00	±0.00	±0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	γ -shape-mcstat-ZZ-SR_obs-BDTG-bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
	γ -shape-mcstat_ZZ_CR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	十0.00	十0.00	±0.00	±0.00	±0.00	±0.00
	γ -shape-mcstat_ $Fakes_CK_obs_BDTG_bin_0 \sim$ shape mcstat $Z CR$ obs $BDTG$ bin 0	00.0±+	00.0 +0.00	00.0 +0000 +0000	±0.00	00.01 +	00.0# +0.00	00.00 + +	±0.00 +0.00	#0.00 +0	00.04 +0.00	00.00 +	00.00 +

Table 32: Breakdown of the dominant systematic uncertainties on background estimates in VR_5^{DF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Total background expectation	188.44	0.06	13.47	0.33	21.10	0.03	1.05	2.63	0.00	2.57	147.21	0.00
Total background error	±48.61	±0.06	± 5.81	± 0.10	± 5.41	± 0.02	± 1.08	± 0.62	土0.00	± 2.62	± 46.02	土0.00
$\alpha_{-t} t \overline{t} Generator$	± 29.13	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 29.13	± 0.00
$\alpha_{-ttISRFSR}$	± 25.37	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	土0.00	±0.00	±0.00		±0.00
α_systttXsec	± 14.72	±0.00	#0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00
Jet energy resolution	± 14.52	±0.00	± 4.16	± 0.05	± 0.23	±0.00	± 0.06	±0.07	±0.00	±0.06	± 10.35	±0.00
CellOut energy scale	± 12.48	±0.00	± 0.64	±0.00	± 0.48	±0.00	± 0.02	± 0.02	±0.00	±0.01	± 11.34	±0.00
a-PileUp	± 9.66	± 0.01	± 1.56	± 0.02	± 0.01	±0.01	± 0.16	±0.01	±0.00	± 0.07	±8.01	±0.00
Jet energy scale	± 7.57	±0.00	± 0.34	± 0.05	± 1.57	±0.01	± 0.14	±0.08	±0.00	± 0.28	±5.79	±0.00
a_ttrartonSnower	10.00 10.00	±0.00	00.0 1 -	00.0 1 −	±0.01	±0.00	00.0 1 1 0	±0.00	±0.00	±0.00		00.00 ₩-
a_trigger	00.001 1 - 10.00	00.0∏	10.40	10.01 +	HU.03	00.0∏ +	H 0.03	+0.00 +	00.0 1 1 0 0 0 1 0 0 0 1	80.0H		10.00 1
$\alpha_{-}W$ W Generator α_{-} M α_{-} M α_{-} M M α_{-} M	H4:0'				H0.00						10.00 14	00.00 H H
γ_{-111}	19 60 - 19 60											800
	H 4.03		H 4.03				8 9 9 H H			но. 10.01	00.00 H H	00.00 H H
a_berrator 	- 0.7 H - 0.7 H -		00.04 H -	00.0 H +			B 0	00.0H	00.0H	10.00 H	00-04 H -	00.00 H -
γ -suape-incstate $\gamma t_{L} v t_{D} 0 s_{D} J t_{D} 0 s_{D} 1 v v$	H4:40		H 0.45				8 0 H H				H	8 9 H H
	нт. 11-15 11-15				H0.43			00.01 H H		70.07	CT.TH	00.00 H H
					H10.03		5 0 H H					00-04-
	60.1H	00.0∏	00.01 H -	n	CU.11	00.0∏	0.0 1 -	- 10.00	00.0∏	00.0H		00.01 H -
CollOnt communication	10.1H											800
CellOut energy resolution	10.01 10.01				10.14 10.01							
v svst Tulus Xser	+0.58	00.0+	0000+	0000+	10.01	000+	0000+	++0.50	000+	000+		000+
aret ZX ser	0000+	000+		000+	000+	000+	000++	10.00	000+	080+	00.0+	800
\sim share most at $WZ VR$ obs BDTG hin 0	+0.23	000+	000+	000+	000+	0000+	+0.23	+0.00	000+	000+	00.0+	00.0+
γ shane mostat $t\bar{t}W + t\bar{t}Z + t\bar{t}WW VR$ obs BDTG bin 0	+0.15	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.15	+0.00	+0.00	+0.00	+0.00
γ -shape-mestat-Z-VR-obs-BDTG-bin-0	± 0.12	± 0.00	±0.00	±0.00	± 0.00	±0.00	+0.00	±0.00	± 0.00	± 0.12	±0.00	±0.00
$\alpha_{\rm syst} WZX { m sec}$	± 0.07	± 0.00	±0.00	± 0.00	± 0.00	+0.00	± 0.07	±0.00	± 0.00	± 0.00	±0.00	± 0.00
γ -shape-mcstat- $H_VR_{obs}BDTG_{bin-0}$	± 0.07	± 0.00	± 0.00	± 0.07	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\alpha_{svst} t Z Xsec$	± 0.06	± 0.06	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-ZZ-VR-obs-BDTG-bin-0	± 0.02	± 0.00	± 0.00	± 0.00	± 0.00	± 0.02	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_tZ_VR_obs_BDTG_bin_0	± 0.02	± 0.02	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
$mu_t t \overline{t} DF$	± 0.01	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00
$\alpha_z Z Z Generator$	± 0.01	±0.00	±0.00	± 0.00	±0.00	± 0.01	±0.00	十0.00	±0.00	±0.00	±0.00	±0.00
α -systZZXsec	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00
γ -shape-mcstat- $DY-VR_{obs}-BDTG_{bin}-0$	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mostat- <i>t</i> akes-V <i>K</i> -obs-BDTG-bin-0	±0.00	±0.00	00.0	±0.00	±0.00	#0.00	00.0 1 -	±0.00	±0.00	±0.00		± 0.00
γ_snape_mostat_ <i>tt_D</i> K_obs_BULIG_DIN_U	00.0H	00.0∏	00.01 H H	00.0 1 ± 0.00	00.0∏ +	00.0∏ +	B.0 ₩ +	+ ± 0.00	00.0 1 1 0 0 0 1 0 0 0 1	00.01 1	00.0H	00.0 1 1
7-suape-incstate <i>vie to n</i> ousebul Guintu A share meetet <i>vie O</i> ahe DDTC him O											00.04 H -	00.00 H H
\sim share mostat $WZ CR$ ohs BDTC bin 0		000+	800++	000+	00.0+	000+	0.04	+10.00	00.0+	000+	00.04	800+
\sim shape mostat $DY CB$ obs BDTG hin 0	+0.00	+0.00	+0.00	+ 0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	00.0+	00.0+
γ -shape-mcstat- <i>H</i> - <i>SR</i> -obs-BDTG-bin-0	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	±0.00	±0.00	±0.00	± 0.00	± 0.00	±0.00	± 0.00
γ -shape-mcstat- WW - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- Wt - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00		± 0.00
γ -shape-mcstat-Z-SR-obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00		± 0.00
α -FakesSyst	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00		± 0.00
γ -shape_mcstat_WZ_SR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00
γ -shape_mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW_CR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW$ _SR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $Fakes$ - SR -obs- $BDTG$ -bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- <i>H</i> - <i>CR</i> -obs-BDTG-bin-0	± 0.00	±0.00	±0.00	±0.00	十0.00	±0.00	±0.00	十0.00	±0.00	±0.00	±0.00	±0.00
γ -shape_mcstat_ $DY_SR_{obs}BDTG_{bin_0}$	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat_ TZ_SK_c obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- $W W - C R$ -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- tZ - CK -obs- $BDTG$ -bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ_shape_mcstat_ZZ_SK_obs_BDTG_bin_0	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat-ZZ-CR_obs_BDTG_bin_0	00.0∏ -	±0.00	0.0 1 1 0.0	±0.00	±0.00	±0.00	00.0 ₩	±0.00	±0.00	±0.00	00.00 + +	± 0.00
γ -snape-mestat- <i>r</i> akes- CR_{obs} -DDS-DD IG-DIN-U \sim share mestat $Z CR_{obs}$ RDTC hin 0	00.01 +0.00	00.0#	8.0 H +	00.0 H +	00.04	00.04	8.0 H +	0000+	00.0H	00.04	00.01 +	8 0 H +
OTHIGTO I AGTSOOTU OTZTIPSOHTAABUSTA.	Tu.uu	HU.UU	ПО-0Н	по-о Н	HU.UU		00.0H	T 0.00	T 0.00	Hu.U	H 0.00	

Table 33: Breakdown of the dominant systematic uncertainties on background estimates in VR_6^{DF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

	0	1										
Total background expectation	243.91	0.06	13.44	0.33	21.07	0.03	1.05	2.63	0.00	2.57	202.73	0.00
Total background error	土34.74	土0.06	± 5.78	± 0.10	± 5.38	± 0.02	± 1.07	± 0.61	±0.00	± 2.59	± 33.02	土0.00
$mu_{}t\overline{D}F$	± 55.08	土0.00	±0.00	土0.00	±0.00	±0.00	土0.00	十0.00	土0.00	±0.00	± 55.08	土0.00
$\alpha_{-tt_{1SKFSK}}$	± 40.80	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00
α_trenerator	±39.00 - 00.21	±0.00	00.0 1 -	± 0.00	±0.00	±0.00	00.0 ₩	±0.00	±0.00	±0.00		₩.01
CLSYSULLASEC	10.02H		H U.U.	00.01 H 10.00			00.0H	H 0.00			10.02 11.06	00.04 H H
Collone an and a control of the cont	107.01 116.26		H 4.10		07.0H		800 H H	20.0H				
CellOut energy scale	±19.50	0.0H	H U. 83	0.0 H H	H0.01	00.0H	10.07 101	10.01		10.01 +0.01	07-01H	B 0 H +
Interp	10.41			10.01	1 20.01	10.04	01-0+					800
ottenengy scare ottenshower	# - 0 * - 0 +	000+	8.0 +	000+	000+	10.04	#100+	00.0+	00.0+	0000+		0.04
or triever	+7.27	0.00+	+0.40	+0.01	+0.63	+0.00	+0.03		+0.00	+0.08		0.00+
\sim share mostat $t\bar{t}$ VB obs BDTG hin 0	10 9+	000+	000+	10.00+	000+	00.0+			+0.00	000+		000+
VWW Concreter	+4.84	000+	800+	000+	+4 84	000+	000++		00 0+	000+		800+
a sust W + X sec	+2.67	000+	10.00+	000+		000+	0000+		+0.00	000+		800+
or ZGenerator	+2.54	+0.00	000+	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+2.54	00.0+	000+
\sim -shape-mostat- $WtVR$ obs_BDTG-bin_0	+2.43	+0.00	+2.43	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00
OV. JVF	+2.00	+0.00	+0.06	+0.00	+0.49	+0.00	+0.00	+0.00	00.0+	+0.02	+1.54	00.01+
Lumi	+1.15	+0.00	+0.37	+0.01	+0.59	+0.00	+0.03	+0.07	+0.00	+0.07		+0.00
CellOut energy resolution	+1.06	+0.00	+0.14	+0.01	+0.14	+0.00	+0.21	+0.00	+0.00	+0.02	+0.86	+0.00
$\alpha_{\rm syst}WW{\rm Xsec}$	± 1.05	± 0.00	± 0.00	± 0.00	± 1.05	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00
$\alpha_{-}WZ$ Generator	± 1.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 1.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- WW - VR -obs-BDTG-bin-0	± 0.81	± 0.00	± 0.00	± 0.00	± 0.81	± 0.00	± 0.00	±0.00	± 0.00	± 0.00		± 0.00
lpha syst Tplus Xsec	± 0.58	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.58	± 0.00	± 0.00		± 0.00
α -systZXsec	± 0.38	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.38		± 0.00
γ -shape-mcstat- WZ - VR -obs-BDTG-bin-0	± 0.23	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.23	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW_VR_obs_BDTG_bin_0$	± 0.15	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.15	± 0.00	± 0.00		± 0.00
γ -shape-mcstat-Z-VR-obs-BDTG-bin-0	± 0.12	十0.00	±0.00	土0.00	±0.00	±0.00	十0.00	±0.00	±0.00	± 0.12	±0.00	±0.00
α syst W ZX sec	± 0.07	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.07		±0.00	±0.00		±0.00
γ -shape-mcstat- $H_VR_obs_BDTG_bin_0$	± 0.07	±0.00	±0.00	± 0.07	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
arsystr X Sec	±0.06	±0.06	0.0 ₩	± 0.00	±0.00	±0.00	00.0 ₩		±0.00	±0.00		00.0 1 -
7_Shane meeted 47 VD abs DDTC him 0	70.07										00.00 H H	
7.2.7.2.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.4.	10.0+	10.01	8.0	0000+	00.0+	10.04	0.0		00.0+	000+		0.0
or syst Z Z Xsec	-00.01 +0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	10000	+0.00	+0.00		+0.00
\sim -shape_mcstat_Fakes_VR_obs_BDTG_bin_0	$\pm 0.00 \pm$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	+0.00	± 0.00	± 0.00		± 0.00
γ -shape-mcstat- $DY_VR_{obs}BDTG_{bin}0$	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	土0.00	十0.00	± 0.00	± 0.00	± 0.00	±0.00
γ_{-} shape_mcstat_ $t\bar{t}_{-}SR_{-}$ obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00		± 0.00
γ -shape-mcstat_Wt_CR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00
γ -shape-mcstat- $WZ_CR_{obs}BDTG_{bin_0}$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00
γ -shape-mcstat- DY - CR -obs- $BDTG$ -bin-0	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	±0.00	土0.00	±0.00	± 0.00	±0.00	±0.00
γ -shape-mcstat- <i>H</i> - <i>SR</i> -obs_ <i>BD</i> ^T <i>G</i> -bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00		±0.00
γ_snape_mcstat_tt_Ct_Ot_Obs_BU_IC_Din_U	00.04	00.0 	8.0 H H	00.0 1 1	00.0	00.0 ∏ +	8.0 H H	00.0H	00.01 1	00.0 	00.0 1 1	0.0 1 1
		000+	0000+	0000+	000+	00.0+	0000+		+0.00	00.0+		000+
\sim shape mostat Wt SR obs BDTG hin 0	00.0+	00.0+	0.00+	0000+	+0.00	0000+	0000+		+0.00	+0.00	800	0000+
\sim shape mostat Z SR obs BDTG hin 0	00.0+	00.01+	0.00+	+0.00	+0.00	+0.00	0.00+		+0.00	+0.00		0000+
a FakesSyst	+0.00	+0.00	+0.00 +	+0.00	+0.00	± 0.00	± 0.00	±0.00	+0.00	± 0.00		+0.00
γ -shape-mcstat- WZ - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\gamma_{\rm shape-mcstat} t\bar{t}W + t\bar{t}Z + t\bar{t}WW_{-}CR_{-}obs_{-}BDTG_{-}bin_{-}0$	± 0.00	土0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00
γ -shape-mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW$ _SR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00		± 0.00
γ _shape_mcstat_ $Fakes_SR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00
γ -shape_mcstat_H_CR_obs_BDTG_bin_0	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00		± 0.00
γ -shape-mcstat- DY - SR -obs- $BDTG$ -bin-0	± 0.00	± 0.00	±0.00	土0.00	±0.00	土0.00	土0.00		±0.00	土0.00	± 0.00	土0.00
	土0.00	±0.00	±0.00	土0.00	±0.00	±0.00	±0.00		±0.00	土0.00		±0.00
γ -shape-mcstat- WW - CR -obs-BDTG-bin-0	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00
γ -shape-mcstat-ZZ-SR-obs-BD'I'G-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	- H	±0.00
7_shape_mcstat_ZZ_CK_obs_BDTG_bin_0	±0.00	±0.00	0.0 ₩	± 0.00	±0.00	±0.00	00.0 ₩	±0.00	±0.00	±0.00	- H	00.0 1 -
γ_shape_mcstat_ <i>Fakes_UK_</i> obs_BUTG_bin_U	00.0∓	00.0	B.0 ₩ +	± 0.00	±0.00	±0.00	00.0 ₩	±0.00	±0.00	±0.00	± 0.00	±0.00
J-min-D T AA-enn-2 T - Z-Z-AA-AA-AA-AA-AA-AA-AA-AA-AA-AA-AA-AA-	22.2 H	22.24			Ī	+	1	==+	====+		+	00 0+

Table 34: Breakdown of the dominant systematic uncertainties on background estimates in VR_6^{DF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Total background expectation	101.87	0.01	4.32	0.00	0.04	0.00	0.08	06.0	0.00	1.43	68.55	26.54
Total background error	土24.49	± 0.01	± 1.74	± 0.02	± 0.23	± 0.03	± 0.39	± 0.23	土0.00	± 1.56	土17.10	土17.17
	1	-	-	-	-	-	- 00		-	-		1
γ -snape-mcstat- $Fakes-V$ h -obs- BD 1 G-Din-U α $t\bar{t}$ GenPlusPS	± 17.13 + 12.49	00.01 +0.00	00.0 H +	8.0 ₩+	00.01 + 00.01	00.01 +0.00	00.0 +	+0.00	00.00 +	00.01 +0.00	±0.00 +12.49	±17.13
Jet energy scale	± 8.70	± 0.00	± 0.00	± 0.01	± 0.00	± 0.00			± 0.00	± 0.47		± 0.00
α -systtfXsec	± 6.85	±0.00	±0.00	±0.00	±0.00	±0.00			+0.00	±0.00	± 6.85	±0.00
γ -shape-mcstat-tt-V R -obs-BD I G-bin-0	+2.98 +2.98	±0.00	00.00 # +	0.00 1 + 0.00	10.00 1000	00.04 +	00.04 1	±0.00	+0.00	100.00		00.00 +
a-tuurren Tet energy resolution	H 4.09 + 1 73	0.04 H 0.04	0.0H		00.0H	00-0+	00.0H		0000+	00.01 +0.03		00.04
$\alpha_z Z$ Generator	± 1.43	+0.00	+0.00	+0.00	+0.00 +	± 0.00	+0.00		± 0.00	± 1.43		+0.00
γ -shape-mcstat- $Wt_VR_{obs}BDTG_{bin_0}$	± 1.31	土0.00	± 1.31	土0.00	土0.00	土0.00	土0.00		土0.00	土0.00		土0.00
a_PileUp	± 0.96	± 0.00	± 0.39	± 0.00	± 0.01	± 0.00	± 0.00		± 0.00	± 0.08		± 0.00
Lumi	± 0.93	土0.00	± 0.12	± 0.00	土0.00	± 0.00	土0.00		± 0.00	± 0.04		± 0.74
CellOut energy scale	± 0.93	±0.00	± 0.27	±0.00	±0.00	±0.00	±0.00		± 0.00	± 0.11	± 0.52	±0.00
$\alpha_{\text{-syst}} W t X \text{sec}$	十0.86 十0.86	±0.00	98.0 +	10.00 1 +	00.00 1	00.04 +	±0.00	±0.00	±0.00	100.00 1	10.00 10.00	00.00 ++
α_{zW} Zummaton \sim shape mostat Z V R obs BDTC hin 0	+0.31	00.0+	8.0	000	00.0+	000+	000+		0000+	+0.31		00.0+
CellOut energy resolution	± 0.28	±0.00	±0.00	十0.00	±0.00	±0.00	±0.00		±0.00	±0.09		±0.00
αWW Generator	± 0.22	± 0.00	± 0.00	± 0.00	± 0.22	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
α _systZXsec	± 0.21	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.21		± 0.00
α_{syst} TplusXsec	± 0.20	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00		±0.00
lpha JVF \sim shane mostat $t\overline{t}W \perp t\overline{t}Z \perp t\overline{t}WW VR$ che BDTC hin 0	01.0±	00.0H	81.0∓	8.0 H +	00.0 1 1 1	00.0 ₩	00.0 ₩ +	10.00 10.08	00.0	00.04	±0.33	00.04 +
γ -shape-mostat- $WZ_VR_obs_BDTG_bin_0$	+0.07	+0.00	+0.00	+0.00	+0.00	+0.00	+0.07		+0.00	+0.00		+0.00
α -FakesSyst	± 0.07	土0.00	±0.00	土0.00	土0.00	± 0.00	±0.00		± 0.00	土0.00		± 0.07
	± 0.03	± 0.00	± 0.00	± 0.00	± 0.00	± 0.03	± 0.00		± 0.00	± 0.00		± 0.00
γ -shape-mcstat- $WWVR$ obs-BDTG-bin-0	± 0.03	±0.00	±0.00	±0.00	± 0.03	±0.00	±0.00		± 0.00	±0.00	±0.00	±0.00
mu_ttSF	±0.01	00.0 1 1 1 1 0 0 0 1 1	00.0 ₩	8 0 H H	00.0 1 1	00.0	10.01 10.01	±0.00	00.0 1 1 1 0 0 0 0 1	00.04		00.0 1 1 1
a system Z X sec	± 0.01	± 0.01	+0.00	+0.00	+0.00	± 0.00	+0.00		± 0.00	± 0.00		+0.00
γ -shape-mcstat- $H_VR_{obs}BDTG_{bin-0}$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00		± 0.00
γ -shape-mcstat- tZ - VR -obs-BDTG-bin-0	±0.00	土0.00	±0.00	±0.00	十0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
a_systWWXsec	±0.00	±0.00	00.00 H H	00.00 H H	±0.00	00.04 +0.00	00.0H	±0.00	10.00	±0.00		00.01 +0
γ_snape_mcstat_Δ_Z_V Λ_008_DD I G_011_0 α svst Z Z Xser	00.01 H H	00.0H	8.0 H +	00 H +	00.0H	00.0H	00.0 H +		00.0 H +	00.0H	00.0H	00.0H
γ -shape-mcstat- DY - VR -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00		±0.00
$\gamma_{\text{-shape-mcstat}}$ $t\overline{t}W + t\overline{t}Z + t\overline{t}WW_{-S}R_{\text{-}}$ obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00		± 0.00
γ -shape_mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW.CR_obs_BDTG_bin_0$	± 0.00	土0.00	±0.00	土0.00	±0.00	±0.00	±0.00		± 0.00	土0.00		土0.00
7_shape_mcstat_ZZ_CR_obs_BDTG_bin_0	±0.00	±0.00	00.00 + +	±0.00	±0.00	±0.00	00.00 + 0.00	±0.00 +0.00	±0.00	±0.00	±0.00	00.00 ++
γ-snape_mcstat_W Z_ZK_ODS_DUIG_DIN_U ~ shane mestet +7 SR ohs RDTC hin 0	10.00 +	00.04	8.0 1 1	8 0 H +	00.0 1 1 1	00.0 ₩	00.0 H +		00.01 +	00.01 1		00.04
γ shape_mestat_ $WW_CR_{obs}BDTG_{bin_0}$	± 0.00	+0.00	+0.00	+0.00	+0.00	± 0.00	+0.00		± 0.00	± 0.00		+0.00
γ _shape_mcstat_ $DY_SR_{obs}BDTG_{bin_0}$	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	土0.00		± 0.00	± 0.00		± 0.00
γ -shape-mcstat_Z_CR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00		± 0.00
γ -shape-mcstat- $H_CR_obs_BDTG_bin_0$	± 0.00	土0.00	土0.00	土0.00	土0.00	± 0.00	土0.00		± 0.00	土0.00		土0.00
γ -shape-mcstat- Wt - CR -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		± 0.00	±0.00		±0.00
γ_snape_mcstat_tt_5.ft_0bs_bD1G_bin_0 ≈ shana mostat 7 SR obs RDTC bin 0	10.00 +	00.04	B.0 ₩	8 0 H +	00.0 1 1 1	00.0 ₩	00.0 H +	10.00 +0.00	00.01 +	00.01 1	00.0#	00.04
γ shape mostat $WZ CB$ obs BDTG bin 0	+0.00	00.01 +0.00	00.01 +0.00	00.0+	00.04	+0.00	00.01 +0.00		+0.00	00.01 +0.00		00.01 +0.00
γ -shape-mcstat- tZ - CR -obs-BDTG-bin-0	土0.00	土0.00	土0.00	土0.00	十0.00	±0.00	土0.00		土0.00	土0.00		十0.00
γ -shape-mcstat-H-SR_obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ _shape_mcstat_WW_SR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00		± 0.00
γ -shape_mcstat_Wt_SR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	+0.00		± 0.00	±0.00		+0.00
γ-shape_mcstat_ <i>Fakes_SK_</i> obs_ <i>BU</i> TG_bin_0	±0.00	±0.00	00.0	10.00 1 + 1	00.0 1 1 1 0 0	00.0	00.0	±0.00	±0.00	±0.00	±0.00	00.04 +
γ-snape_mcstat_ <i>tt_C</i> .t_obs_BD_1G_DIN_U ~ shape meetst <i>Fabse</i> CR abs BDTC hin 0	10.00 +	00.04	B.0 ₩	8 0 H +	00.0 1 1 1	00.0 ₩	00.0 H +		00.0 +	00.01 1		00.04
γ -shape-mestat- ZZ - SR -obs-BDTG-bin-0	± 0.00	+0.00	+0.00	+0.00	+0.00	± 0.00	+0.00		± 0.00	± 0.00		+0.00
\sim shape mostat $DY_CR_obs_BDTG_bin_0$			-									

Table 35: Breakdown of the dominant systematic uncertainties on background estimates in VR_1^{SF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Oncertainty of channel	1 u 1	2										
Total background expectation	81.27	0.01	4.32	0.00	0.04	0.00	0.08	0.90	000	1.43	47.95	26.54
Total background error	± 19.78	± 0.01	± 1.73	± 0.02	± 0.23	± 0.03	± 0.39	± 0.23	±0.00	± 1.55	土9.70	土17.17
γ -shape_mcstat_Fakes_VR_obs_BDTG_bin_0	± 17.15	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	± 17.15
α_LtGettf tust 3	но.00 Не 13										13 13 13	
. Let energy scale	+6.20		000+	+0.01	000+	000+	+0.03	+0.07	000+	+0.47	+5.61	000+
or svsttfXsec	+4.74	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+4.74	+0.00
$\gamma_{-\text{shape-mcstat-}t\bar{t}-}^{-}VR_{-}\text{obs-}BDTG_{-}\text{bin-}0$	± 2.09	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00 ±	±0.00	±0.00	±0.00	± 2.09	±0.00
α _t t ISRFSR	+2.08	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+2.08	+0.00
$\alpha_z Z$ Generator	± 1.42	土0.00	土0.00	±0.00	±0.00	±0.00	十0.00	±0.00	±0.00	± 1.42	±0.00	±0.00
γ -shape-mcstat- $Wt_VR_obs_BDTG_bin_0$	± 1.31	± 0.00	± 1.31	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
Jet energy resolution	± 1.03	± 0.01	± 0.55	± 0.00	± 0.04	± 0.00	± 0.06	± 0.03	± 0.00	± 0.03	± 1.59	± 0.00
Lumi	± 0.93	± 0.00	± 0.12	± 0.00	± 0.00	± 0.00	± 0.00	± 0.03	± 0.00	± 0.04	± 0.00	± 0.74
α _systWtXsec	± 0.86	± 0.00	± 0.86	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00
CellOut energy scale	± 0.76	± 0.00	± 0.27	± 0.00	± 0.00	± 0.00	± 0.00	± 0.02	± 0.00	± 0.11	± 0.36	± 0.00
a_PileUp	± 0.52	± 0.00	± 0.38	± 0.00	± 0.01	± 0.00	± 0.00	± 0.03	± 0.00	± 0.08	± 1.01	± 0.00
α -WZGenerator	+0.37	+0.00	+0.00	+0.00	+0.00	+0.00	+0.37	± 0.00	+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat-Z-VR_obs-BDTG_bin_0	± 0.31	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.31	± 0.00	± 0.00
\alphaWWGenerator	+0.22	+0.00	+0.00	+0.00	+0.22	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
CellOut energy resolution	± 0.21	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.02	± 0.00	± 0.09	± 0.14	± 0.00
α -systZXsec	± 0.21	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.21	± 0.00	± 0.00
α -systTplusXsec	± 0.20	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW_VN_cObs_BDTG_bin_0$	± 0.08	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.08	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $WZ-VR$ -obs-BDTG-bin-0	± 0.07	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.07		± 0.00	± 0.00	± 0.00	± 0.00
α -FakesSyst	± 0.07	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.07
α JVF	± 0.06	± 0.00	± 0.18	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.23	± 0.00
$\alpha_Z Z Generator$	± 0.03	± 0.00	± 0.00	± 0.00	± 0.00	± 0.03	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- WW - VR -obs-BDTG-bin-0	± 0.03	± 0.00	土0.00	± 0.00	± 0.03	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00
α -syst WZX sec	± 0.01	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.01		土0.00	± 0.00	± 0.00	± 0.00
α -systtZXsec	± 0.01	± 0.01	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	± 0.00
γ -shape-mcstat- <i>H</i> - <i>VK</i> -obs- <i>BD</i> 'IG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	± 0.00
γ -shape-mcstat- $tZ-VK_{-}$ obs- $BDTG$ -bin-0	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	00.0 ₩		±0.00	±0.00	±0.00	± 0.00
α -syst W W Asec	±0.00	±0.00	00.0 ₩	± 0.00	±0.00	±0.00	± 0.00		±0.00	±0.00	±0.00	± 0.00
γ -shape-mcstat-ZZ-VK-obs-BUTG-bin-0	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	00.0 1 0		±0.00	±0.00	±0.00	± 0.00
a-systamatic and the prime	00.0H-	00.04	00-04-	00.0 H	00.0H	00.0H	00.04 H -		00.0H	00.0H	00.0H	00.0 H
γ_snape_mestat_ <i>DT_V</i> f_obs_ <i>BD</i> I G_bin_0	00.0H	00.0H	00.04 H	10.00 H	00.0H	00.0H	00.04 H +	±0.00	00.0H	00.0H	00.0H	00.0H
$0^{-111} \cap T \cap $												
$\gamma_{\text{subplut}} = mestat_{it} W + it \Delta + itW W - One DD I G = 0111 - 0$	00.0H		р. Н -	00.01 H			00.01 H		00.0H		00.0H	00.0H
7-snape-mestat-ZZ-C n-obs-DD 1G-DII-0	00.0H			00.0 H +			00.00 H +				00.0H	00.0H
γ_shape_incstate_tz_D_D_D_s_DD_1G_DH_U												
2. chose moster DV CD che DDTC his D								00.01				
A shape_mustate I C C P she BDTC him 0 A shape most star Z C P she BDTC him 0							8.0					
Current and the AD of a DTTC building the state of the st							8.0	00.01				
γ -snape-mestat- W t- C K_{-} ODS- D J G-DIN-U	00.0H	00.0H	00.04 H	10.00 H	00.0H	00.0H	00.04 H +		00.0H	00.0H	00.0H	00.0H
γ -snape-mcstat-tt-C ft-obs-BULIG-bin-U	00.0 1 −	00.0∏	00.0 ₩	± 0.00	00.0∏	00.0∏	00.0 ₩	±0.00	±0.00	±0.00	00.0∏	± 0.00
γ -snape-mcstat- <i>tt_5K</i> -obs- <i>BU</i> TG-bm-0	±0.00	±0.00	00.0 ₩	± 0.00	±0.00	±0.00	± 0.00		±0.00	±0.00	±0.00	± 0.00
γ -shape-mcstat-Z-SK-obs-BUTG-bin-U	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00
γ_shape_mcstat_W Z_CK_obs_BDTG_bin_U	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	00.0 ₩		±0.00	±0.00	±0.00	± 0.00
γ-snape-mcstat-tz-CK-008-DUIG-DUIG-0	00.0H	00.0H	00.0 H -	H U.UU	00.0∏	00.01 1	00.0 H -	±0.00	00.0H	10.00 1 −	00.0∏	00.0 1 −
γ_snape_mcstat_W W_S.K_obs_BD IG_bin_0	00.0 1 1	00.0∏	00.0 ₩	± 0.00	00.0∏	00.0∏	00.0 ₩		±0.00	±0.00	00.0∏	± 0.00
γ -shape-mcstat- $Wt_{CD}K_{CD}$	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	00.0 ₩		±0.00	±0.00	±0.00	± 0.00
γ_shape_mcstat_H_SK_obs_BDTG_bin_0	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	00.0 ₩	±0.00	±0.00	±0.00	±0.00	± 0.00
γ -shape-mcstat- <i>Fakes_SK</i> -obs_BDTG-bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00
γ -shape-mcstat- <i>Fakes_CK</i> -obs_BDTG-bin_0	±0.00	±0.00	±0.00	± 0.00	±0.00	#0.00	00.0		#0.00	±0.00	±0.00	# 0.00
γ-snape-mcstat-ZZ-ZZ-Ac-obs-BU LG-DIn-U	00.0 1 1	±0.00	00.0 ₩ -	± 0.00	00.0 1 1	00.0±	00.0 ₩	±0.00	±0.00	±0.00	±0.00	10.00
\sim shane most at IIY (H obs HI' (\downarrow bin ()											000	

Table 36: Breakdown of the dominant systematic uncertainties on background estimates in VR_1^{SF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Uncertainty of channel	VR_{S}^{2T}	tZ	Wt	5	44 44	2	2	M M M 1 + 7 1 + M 1 1	2			
Total background expectation	94.58	0.01	5.65	0.02	0.11	0.00	0.08	0.87	0.02	2.78	68.09	16.95
Total background error	± 23.12	± 0.02	± 2.35	± 0.03	± 0.24	± 0.03	± 0.32	± 0.25	± 0.09	± 2.95	± 16.95	± 14.02
γ _shape_mcstat_Fakes_VR_obs_BDTG_bin_0	± 14.01	土0.00	±0.00	± 0.00	±0.00	±0.00 ±0.00	±0.00 ±0.00	年0.00 10.00	±0.00	±0.00 10.00	土0.00	± 14.01
Jet energy scale α $t\bar{t}GenPlusPS$	H12.34 +9.97	10.01 H + 0.01	06.0H	70.07 H +	70.07 +0.01	00.0H	000 H	01.01 +0.01	00.0 H +	2000 H	26.01H	00.0H
$\alpha_{ m syst}t\bar{t}Xsec$	± 6.81	土0.00	土0.00	±0.00	土0.00	+0.00	+0.00	±0.00	+0.00	+0.00	± 6.81	±0.00
$\alpha_{-t\bar{t}ISRFSR}$	± 3.82	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 3.82	± 0.00
γ -shape-mcstat- $t\bar{t}$ - VR -obs-BDTG-bin-0	± 2.97	土0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 2.97	± 0.00
α_Z Generator	± 2.78	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 2.78	±0.00	±0.00
α-PileUp	± 1.67	±0.00	± 0.19	± 0.01	±0.00	±0.00	±0.00	± 0.02	± 0.09	± 0.03	± 1.61	±0.00
γ _shape_mcstat_W t_V K_obs_BDTG_bin_0	±1.61	±0.00	±1.61 ±1.61	00.0 ₩	±0.00	±0.00	#0.00	±0.00	± 0.00	#0.00	±0.00	±0.00
$\alpha_{\rm syst} W t X sec$	+ 1.13	10.00 10.00	±1.13	10.00 10.00	100.00 10.00	00.0 <u>+</u>	10.00 10.00	±0.00	00.01 +	00.0 1 1 0 0 0 1 0 0 1 0 0 1 0 0 1 0 0 1 0 0 0 1 0 0 0 1 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	±0.00	±0.00
Jet energy resolution Lumi	ED.1 I		10.00	10 0 H	H0.04		000+	01-01+	00.0H	80.0H	+0.04	10 00 H
\sim shape mostat Z V R obs BDTC hin 0	+ +	+0.00	+0.00	0000+	+0.00	0000+	00.0+	00.0+	+0.00	+0.55	000+	00.0+
α syst ZXsec	± 0.42	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.42	+0.00	±0.00
α_{-} ĴVF	± 0.33	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.04	± 0.30	± 0.00
α -W Z Generator	± 0.30	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.30	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
CellOut energy scale	± 0.29	± 0.00	± 0.15	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.05	± 0.21	± 0.00
α -WWGenerator	± 0.22	±0.00	±0.00	±0.00	± 0.22	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	十0.00
a_systTplusXsec	± 0.19	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.19	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- <i>itW</i> + <i>itZ</i> + <i>itW</i> W -V R-00S-DD1 G-D11-0 \sim shape mostat WZ VR obs RDTC hin 0	10.00 100		8.0 H H	B 0 H +			00.0H	00 0H	00.0H+		00.0H	
	+0.07	+0.00	+0.00	0.00+	+0.00	+0.00	+0.00	00.00+	+0.00	+0.00	+0.00	+0.07
$\gamma_{\text{-shape-mcstat-}}WW_VR_{\text{-obs-}}BDTG_{\text{-bin-}}0$	± 0.05	±0.00	±0.00	±0.00	± 0.05	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
	± 0.03	± 0.01	± 0.56	± 0.00	± 0.07	± 0.00	± 0.00		± 0.00	± 0.22	± 0.89	± 0.00
	± 0.03	土0.00	±0.00	土0.00	±0.00	± 0.03	十0.00	十0.00	土0.00	十0.00	±0.00	土0.00
γ -shape-mcstat- $DY - VR_{obs-BD} \GammaG_{bin-0}$	± 0.02	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.02	±0.00	±0.00	±0.00
γ_snape_incstat_n_v n_obs_DD i G_bin_0 α syst+7Xsec	T0.01	0.0H	8.0 H +	10.0H	00.0H	00.0H	000 H +	10.00 +0.00	00.0H	00.0H	00.0H	00.0H
γ -shape-mcstat- tZ - VR -obs-BDTG-bin-0	± 0.01	土0.01	±0.00	±0.00	土0.00	土0.00	土0.00	±0.00	土0.00	土0.00	土0.00	土0.00
mu_ttSF	± 0.01	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.01	± 0.00
α -syst WZX sec	± 0.01	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.01	±0.00	±0.00	±0.00	±0.00	±0.00
a_syst W W Xsec	± 0.01	±0.00	00.00 + +	00.00 + +	±0.01	±0.00	00.04 +	+0.00	10.00	±0.00	±0.00	±0.00
y sust ZZXsec	+0.00	00.01	00.01	0000	00.0+	00.0+	00.0+	+0.00	0.00+	00.0+	+0.00	00.01
γ -shape-mcstat- $t\bar{t}W + t\bar{t}Z + t\bar{t}WW$ - SR -obs-BDTG-bin-0	土0.00	土0.00	土0.00	十0.00	十0.00	十0.00	十0.00	±0.00	±0.00	土0.00	十0.00	土0.00
γ _shape_mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW_CR$ _obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-ZZ-CR-obs-BDTG-bin-0	±0.00	土0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
7_shape_mestat_W Z_SK_obs_BDTG_bin_U	± 0.00	00.01 +0	0.0 H H	0.04 1	00.01 +	00.0	00.04 4	00.00 + #	10.00 1	00.0∏ +	±0.00	±0.00
\sim shape mostat $WW CR$ obs BDTG hin 0	00.0 +	00.0+	8.0	00.0+	00.04	00.0+	00.0+	00.0++	0000+	00.0+	0000+	00.01 +0.00
γ _shape_mcstat_ DY _ SR _obs_BDTG_bin_0	+0.00	±0.00	+0.00	±0.00	± 0.00	+0.00	±0.00	±0.00	± 0.00	± 0.00	+0.00	+0.00
γ -shape-mcstat-Z-CR_obs_BDTG_bin_0	± 0.00	土0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- H - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- Wt - CR -obs- $BDTG$ -bin- 0	土0.00	土0.00	土0.00	±0.00	土0.00	土0.00	±0.00	±0.00	±0.00	土0.00	±0.00	土0.00
γ -shape_mcstat_tt_SR_obs_BDTG_bin_0	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
7_shape_mcstat_Z_SK_obs_BDTG_bin_0	±0.00	±0.00	±0.00	00.0 ₩	±0.00	±0.00	#0.00	±0.00	± 0.00	#0.00	00.01 +	±0.00
7_snape_mcstat_W Z_CK_obs_BD1G_bin_0	00.0 1 1	00.01 ₩	0.0 ₩	B 0	00.01 ₩	00.0 1 1 1 0	00.0 1 1 1 0	00.0 1 1 1 0 0 0 0 1	00.0 1 1	00.01 1	00.0∏	±0.00
γ -shape-micstat-t/2-C/A-008-D/1/G-D/11-0 \sim shape mostat $H SR$ ohs BDTG hin 0	00.0H		8.0 H +	8 0 H +	00.0H	00.0H	000 H +	0.01 +0.00	00.0 H +	00.0H	00.0H	00.0H
γ -shape-mestat- WW - SR -obs-BDTG-bin-0	± 0.00	+0.00	+0.00	+0.00	± 0.00	± 0.00	+0.00	+0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- Wt - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $Fakes$ - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ _shape_mcstat_ $t\bar{t}$ _ $CR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ _shape_mcstat_ $Fakes_CR_obs_BDTG_bin_0$	土0.00	土0.00	土0.00	±0.00	土0.00	土0.00	土0.00	±0.00	±0.00	土0.00	±0.00	土0.00
γ -shape-mestat-ZZ-SR-obs-BDTG-bin-0	+0.00	+0.00 ++	00.00 + +	0.00 ++	0.00 ++	00.00 + 0.00	00.00 + 0.00	±0.00	±0.00	00.00 + 0.00	±0.00	±0.00
λ -maps i α -san-ar γ - i β -ranse i ar solution i a	H C.CC	2000 H	30.5	2.2	20.02		111111	1 11.111	1 1 1 1 1 1 1 1			

Table 37: Breakdown of the dominant systematic uncertainties on background estimates in VR_2^{SF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Uncertainty of channel	VRS^{-1}	tZ	W t		11 11	1	1	AAAAAA + 777 + AAAA	17			
Total background expectation	74.06	0.01	5.65	0.02	0.11	0.00	0.08	0.87	0.02	2 2.78	8 47.57	7 16.95
Total background error	± 17.45	± 0.02	土2.34	土0.03	± 0.24	±0.03	± 0.31	± 0.25	±0.09	± 2	$.93 \pm 9.24$	4 ± 14.02
γ -shape-mcstat-Fakes-VR-obs-BDTG-bin-0	± 14.01	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	00 +0.00	00 ±0.00	+1.
Jet energy scale ~ 44ConDineDS	±9.07 +6.03	±0.01	0.95 10.95	±0.02	±0.02	00.0±	± 0.03	±0.10	10.00 +0.00			00.0 + 0.00
mu_tīSF	± 6.38	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00 ±0.00	±0.00			
α -syst $t\bar{t}X$ sec	± 4.70	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00			
$\alpha_{-}t\bar{t}$ ISRFSR	± 2.98	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00			
α_Z Generator	± 2.76	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	00 ± 2.76		
γ -shape-mcstat- $tt_V R$ -obs-BDTG bin-0	± 2.08	10.00 1	±0.00	±0.00	±0.00	10.00 1	00.0 H +	±0.00	±0.00			++ ++
	10.11 +1	00.0H	10.11 10.10	10.01 10.01				10.00 10.00		00 ±0.00	00 ± 11 10	
art IteOp or syst Wt Xsec	± 1.12	00.01	+1.12	10.01 + 0.00	0000 +0.00	00.01	8.0 H +	70.0T	00.0±			
Lumi	± 0.74	±0.00	± 0.16	±0.00	±0.00	±0.00	十0.00	± 0.02	10.00			
Jet energy resolution	± 0.59	± 0.01	± 0.59	± 0.01	± 0.04	± 0.00	± 0.06	± 0.10	± 0.00			
γ -shape_mcstat_Z_VR_obs_BDTG_bin_0	± 0.55	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00			
α -systZXsec	± 0.41	±0.00	±0.00	±0.00	土0.00	±0.00	十0.00	± 0.00	±0.00			
α_{MZG} enerator	± 0.30	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.30	±0.00	±0.00			
allOut snarwr resolution CellOut snarwr resolution	H0.24	0.0H	H0.00	00.0H	00.0H		B 0 H +	10.00 1	00.0H	00 ±0.04	14 ±0.21	1 H 0.00
CellOut energy resolution CellOut energy scale	± 0.23	±0.00	± 0.15	±0.00	±0.00	±0.00	±0.00	± 0.02	±0.00			
αWW Generator	± 0.21	± 0.00	土0.00	± 0.00	± 0.21	± 0.00	± 0.00	± 0.00	± 0.00			
	± 0.19	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.19	± 0.00			
γ -shape-mcstat_ttW + ttZ + ttWW_VR_obs_BDTG_bin_0	± 0.08	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	± 0.08	±0.00			
γ_snape_mcstat_W Z_V K_ODS_BU I G_DIN_U ~ FobeeStet	±0.07	00.0 01 01 01 01 01 01 01 01 01	B.0 ₩	00.0 + 0	00.0 1 1 0 0	00.0#	20.0 H	10.00 +0.00	00.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	00 ±0.00	00.0 1 0 0 0 0 0 0 0 0	100.01 1001
γ -shape-mestat- WW - VR -obs-BDTG-bin-0	± 0.05	±0.00	±0.00	±0.00	± 0.05	±0.00	±0.00	±0.00 ±0.00	±0.00 ±0.00			
$\alpha_{-}ZZGenerator$	± 0.03	± 0.00	± 0.00	± 0.00	± 0.00	± 0.03	± 0.00	± 0.00	± 0.00			
γ -shape-mcstat- DY - VR -obs-BDTG-bin-0	± 0.02	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.02			
γ_shape_mcstat_H_V R_obs_BDTG_bin_0	±0.01	±0.00	0.0 ₩ +	10.01 + 0.01	00.01 ₩	00.0 1 1 1 0 0	8.0 H H	±0.00	10.00 110.00	00 ±0000	00 ±0.00	1 = 0.00
γ -shape-mestat- $tZ_VR_obs_BDTG_bin_0$	土0.01	土0.01	十0.00	十0.00	土0.00	十0.00	十0.00	土0.00	±0.00 ±0.00			
α -syst WZ Xsec	± 0.01	± 0.00	土0.00	± 0.00	土0.00	± 0.00	± 0.01	± 0.00	±0.00			
a_systWWXsec	± 0.01	±0.00	±0.00	±0.00	± 0.01	±0.00	±0.00	±0.00	±0.00		00 ±0.00	
γ_snape_mestat_ΔZ_V A_008_BD1G_D1n_0 α_svstZZXsee	00.01 +0.00	00.0 1 1	00.0 ₩+	00.00 + 0.00	00.0 +0.00	00.0 1 1	00.0 H +	±0.00	00.0 +0.00	00 ± 0.00 00 + 0.00		00.0 + 00.0
γ -shape-mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW$ _ SR _obs_BDTG_bin_0	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00			
γ -shape-mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW$ - CR -obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00			
γ -shape-mcstat-ZZ-CR-obs-BDTG-bin-0	土0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00			
γ_shape_mestat_WZ_SK_obs_BUTG_bm_U	00.0±	00.0 1 1	0.0 ₩	±0.00	100.00 1	±0.00	0.0 H H	±0.00	10.00 10.00 10.00	00 ±0.00		00.00 + + 0.00
\sim shape mostat $WW CR$ obs BDTG bin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	0.00+	+0.00	+0.00			
γ -shape-mcstat- DY - SR -obs- $BDTG$ -bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	十0.00	±0.00	±0.00			
γ -shape-mcstat-Z-CR-obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		00 ±0.00	
γ -shape_mcstat_H_CR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	±0.00			++
γ -shape-mcstat- Wt - CR -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00			
γ -shape_mcstat_tt_CK_obs_BDTC +in_0	00.0±	00.0 1 1	0.0 ₩	±0.00	100.00 1	±0.00	0.0 H H	±0.00	100.01 100.01	00 ±0.00		00.00 + + 0.00
γ_snape_mcstat_ <i>tt_C</i> _DK_ODS_DU I G_DIN_U	00.01	00.0H	8.0 H	00.01 1				10.00 1				
\sim shane mostat $WZ CR$ obs BDTG bin 0	00.01 +	00.04	8.0 H +	00.0 +	00.04	00.0H	8.0 H +	00.01 +0.00				
\sim shane mostat $12 CR$ obs BDTG hin 0	+0.00	+0.00	00.0+	+0.00	+0.00	+0.00	0.01+	+0.00	00.0+			
γ -shape-mcstat- WW - SR -obs-BDTG-bin-0	± 0.00	土0.00	±0.00	± 0.00	土0.00	土0.00	土0.00	±0.00	±0.00			
γ -shape-mcstat- $Wt_SR_{obs}BDTG_{bin_0}$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	00 ± 0.00		0 ± 0.00
γ -shape_mcstat_H_SR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00			0.0 ± 0.00
γ -shape-mcstat- $Fakes$ - SR -obs-BDTG-bin-0	± 0.00	± 0.00	±0.00	± 0.00	土0.00	± 0.00	±0.00	± 0.00	±0.00			
γ -shape-mestat- $Fakes$ - CR -obs-BDTG-bin-0	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00			0.00
γ -snape-mcstat- $\Delta L_{2}M_{2}$ obs- $BUIG_{1}$ U G_{2} shape mcstat $DY CR$ obs $BDTG$ bin 0	00.0 +0.00	00.0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0.0 ₩	00.01 + 0.00	00.0 ₩	00.0 + 00.0	00.0 H +	±0.00 +0.00	00.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	00 ±0.00	00.0∓ 00	
n-margin T d d -san T T d -san T d				00.0	00.01	0.0	00.01	- n.uu				

Table 38: Breakdown of the dominant systematic uncertainties on background estimates in VR_2^{SF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Total background expectation Total background error γ -shape-mcstat-Fakes-VR-obs_BDTG-bin-0	109.44	0.01	5.12	0.02	0.17	0.00	0.08	1.03	0.00	2.56	73.92	26.55
0 ii			010								00 1 -	
in_0	± 25.80	± 0.01	±2.19	± 0.03	土0.27	土0.04	± 0.53	± 0.28	土0.00	± 2.69	± 17.99	土17.17
in_0	1	-	-	0	0	0	0	-	0	-	00	1
	± 17.13 ± 12.83	00.0 ₩	±0.00 +0.63	8.0 10.0	±0.00 +0_03	00.0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	±0.01 10.03	±0.00 +0_11	00.0 +	±0.00 +0.45	±0.00 +11.57	11.110 +0.00
	± 10.24	十0.00	十0.00	土0.00	土0.00	土0.00	土0.00	±0.00	土0.00	土0.00	± 10.24	土0.00
	± 7.39	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 7.39	± 0.00
	土3.37	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	±0.00	土0.00	土0.00	± 3.37	土0.00
	± 3.16	± 0.01	± 0.93	± 0.02	± 0.01	±0.00	±0.06	土0.04	±0.00	± 0.24	± 2.51	±0.00
γ _shape_mcstat_tt_V A_obs_BDTG_bin_0	±3.13 ±3.56	00.0 1 1 0 0 0 1	00.0∏	0.0 1 + +	00.01 1	00.0 1 1 0 0 0	0.04 1	±0.00	±0.00	±0.00	±3.13	00.01 +0.00
+ W + V R ohe BDTG him 0	+ 1 53		+1 53	8 8 6 4	00.0H	00.0H	8.0 H +	00.01 +0.00	00.0 H +	00.0H	00.0H	00.0H
	+1.28	+0.00	+0.22	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+1.06	+0.00
ution	± 1.15	+0.00	$\pm 0.00 \pm$	±0.00	± 0.02	± 0.00	+0.00	+0.00	± 0.00	± 0.10	± 1.08	+0.00
	土1.14	土0.00	± 0.27	土0.00	± 0.02	土0.00	土0.00	± 0.04	土0.00	± 0.11	土0.77	土0.00
α -syst W tXsec	± 1.02	± 0.00	± 1.02	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
	± 0.99	±0.00	± 0.14	±0.00	±0.00	±0.00	±0.00	± 0.03	±0.00	± 0.07	±0.00	± 0.74
γ_shape_mcstat_Z_V K_obs_BDTG_bin_0	± 0.53	00.01 +	±0.00	00.00 1 +	±0.00	10.00 10.00	10.00 1	±0.00	+0.00	± 0.53	±0.00	±0.00
	70.07 +0.38		00.0H	8.0 H +			70.0H		00.0H	00.0H		00.0H
	+0.28	+0.00	+0.18	0.00 + 0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.04	+0.42	+0.00
Generator	± 0.25	+0.00	±0.00	土0.00	± 0.25	±0.00	±0.00	±0.00	± 0.00	+0.00	±0.00	±0.00
	± 0.23	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.23	± 0.00	± 0.00	± 0.00	± 0.00
$\operatorname{at}_{t\bar{t}W} + t\bar{t}Z + t\bar{t}WW_VR_obs_BDTG_bin_0$	± 0.09	土0.00	土0.00	土 0.00	土0.00	± 0.00	± 0.00	土0.09	土0.00	± 0.00	土0.00	± 0.00
	± 0.07	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	± 0.07
γ -shape-mcstat- $WW-VK$ -obs- $BDTG$ -bin-0	±0.07	00.04 +	±0.00	00.00 H H	±0.07	10.00 1	10.00 1	±0.00	00.00 + + 0.00	100.00 100.00	±0.00	00.01 +0.00
0	+0.04	00.01 +0.00	00.01 +0.00	00.00+	+0.00	+0.04	0.01+	+0.00	+0.00	00.01 +0.00	+0.00	+0.00
$H_VR_{obs}BDTG_{bin_0}$	± 0.01	±0.00	±0.00	土0.01	±0.00	十0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
	± 0.01	± 0.00	± 0.00	± 0.00	± 0.01	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
	± 0.01	土0.00	土0.00	土0.00	土0.00	± 0.00	土0.00	十0.00	± 0.00	± 0.00	土0.01	土0.00
	±0.01	±0.01	±0.00	00.0 ₩	±0.00	#0.00	0.0 1 1 0	±0.00	±0.00	#0.00	00.01 -	±0.00
α -systw $\Delta \Lambda$ sec \sim share mostat $+Z VR$ ohs RDTC hin 0	10.01 +	00.0H	00.04	8 8 5 4	00.0H		10.0H	00.01 +0.00	00.0 H +	00.0H	00.0H	00.0H
0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
	土0.00	土0.00	土0.00	土0.00	土0.00	± 0.00	±0.00	土0.00	± 0.00	± 0.00	土0.00	土0.00
γ -shape-mcstat- DY - VR -obs-BDTG-bin-0	土0.00	十0.00	土0.00	土 0.00	± 0.00	十0.00	十0.00	±0.00	± 0.00	十0.00	±0.00	土0.00
	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	十0.00	±0.00	±0.00	±0.00	±0.00
	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape_incstat_ $\Delta \omega \sim 0.05$ _DU LG_DILU $\sim shape metat WZ SR obs RDTC hin 0$	00.0 H +	00.0H	00.0H	8 9 7 4	00.0H	00.0H	B 0 H +	00.01 +0.00	00.0 H +	00.0H	00.0H	00.0H
	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
0	± 0.00	± 0.00	土0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
	土0.00	±0.00	±0.00	土0.00	土0.00	土0.00	±0.00	±0.00	土0.00	土0.00	土0.00	土0.00
	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mostat-W t-CK-obs-BUTG-bin-U	±0.00	00.0 1 1 1 0 0 1	00.0 ₩ +	0.0 1 + +	00.0∏	00.0 1 1	00.0 1 1 1	10.00 1	10.00 1 ± 0.00	00.01 +0	00.01 +000	00.01 +0.00
	0.00 +	00.0+	00.0+	0.0	00.0+	00.01	0000+	+0.00	00.0 +	00.01	00.01 +0.00	00.01 +0.00
γ -shape-mcstat-WZ-CR-obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	十0.00	±0.00	±0.00	±0.00	±0.00	±0.00	十0.00	±0.00
	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
	土0.00	土0.00	土0.00	土 0.00	± 0.00	土0.00	土0.00	±0.00	土0.00	± 0.00	± 0.00	土0.00
oin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00
	± 0.00	±0.00	±0.00	00.0 1 -	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	00.01 -	±0.00
0-1	±0.00	00.04 1	00.0∏	00.00 1 + +	±0.00	00.04 1	00.00 H H	±0.00	±0.00	100.01	±0.00	±0.00
γ -shape-mostat- $DY_CR_obs_BDTG_{bin}$ 0	10.00 +0.00	00.01 +0.00	00.00 + 0.00	00.00 H +	00.01 +0.00	00.00+	00.0H	00.00 +0.00	0.00 +	00.01 10.00	00.01 +0.00	00.01 +0.00

Table 39: Breakdown of the dominant systematic uncertainties on background estimates in VR_3^{SF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Uncertainty of channel	VR_3^{ST}	tZ	7 11	-	A A A A A A A A A A A A A A A A A A A		:	11 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				
Total background expectation	87.26	0.01	5.12	0.02	0.17	0.00	0.08	1.03	0.00	2.56	51.73	26.55
Total background error	± 20.18	± 0.01	± 2.18	± 0.03	± 0.27	± 0.04	± 0.53	± 0.27	土0.00	± 2.68	土9.57	土17.17
	1	-	-	-	-	-	-	-	-	-	-	1
γ -shape_mcstat_ <i>Fakes_V K</i> _obs_BD'I'G_bin_U	±17.15	00.0	±0.00 10.00	+0.00	±0.00	00.0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	0.0 1 0.0	±0.00 ±0.11	00.0 1 1 1 0 0 0 1 1	10.00 140.00	00.0 ₩ 10.00	±17.15
or trGenPlusPS	+7.11	+0.00	+0.00+	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+7.11	+0.00
mu - $t\bar{t}\mathrm{SF}$	± 6.96	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 6.96	± 0.00
$\alpha_{-systt} t \overline{t} Xsec$	± 5.14	土0.00	± 0.00	土0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 5.14	± 0.00
$\alpha_{-t\tilde{t}ISRFSR}$	± 2.75	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 2.75	± 0.00
α_Z Generator	± 2.54	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 2.54	± 0.00	± 0.00
Jet energy resolution	± 2.39	± 0.01	± 0.93	± 0.02	± 0.01	± 0.00	± 0.06	± 0.04	± 0.00	± 0.24	± 1.74	± 0.00
	± 2.19	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 2.19	± 0.00
γ -shape-mcstat- Wt - VR -obs-BDTG-bin-0	± 1.53	± 0.00	± 1.53	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
lpha -syst W tXsec	± 1.02	± 0.00	± 1.02	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
Lumi	± 0.99	± 0.00	± 0.14	± 0.00	± 0.00	± 0.00	± 0.00	± 0.03	± 0.00	± 0.07	± 0.00	± 0.74
CellOut energy scale	± 0.96	±0.00	± 0.22	±0.00	±0.00	± 0.00	±0.00	十0.00	±0.00	± 0.00	± 0.74	± 0.00
∞_PileUp	±0.90	±0.00	± 0.26	±0.00	± 0.02	±0.00	±0.00	± 0.03	±0.00	± 0.11	± 0.54	±0.00
CellOut energy resolution	± 0.82	±0.00	±0.00	±0.00	± 0.02	±0.00	±0.00	±0.00	±0.00	± 0.10	± 0.75	±0.00
γ_snape_mcstat_Z_V K_obs_BUTG_bin_U	±0.53	00.0±	00.0∏	± 0.00	±0.00	±0.00	00.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		±0.00	±0.03	00.0∏	± 0.00
α_W ΔGenerator	70.07 H						70.07 H H					
a WW Generator	+0.25	00.01	0.00+	+0.00	+0.25	+0.00	0.00+	0000++	+0.00	00.0+	+0.00	+0.00
α -systTplusXsec	± 0.22	± 0.00	土0.00	±0.00	土0.00	土0.00	±0.00	± 0.22	土0.00	土0.00	±0.00	±0.00
α_JVF	± 0.15	± 0.00	± 0.18	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.04	± 0.29	± 0.00
γ -shape_mcstat_t $\bar{t}W + t\bar{t}Z + t\bar{t}WWVR_obs_BDTG_bin_0$	土0.09	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.09	土0.00	土0.00	土0.00	土0.00
α -FakesSyst	± 0.07	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.07
7_shape_mcstat_W W_V A_obs_BDTG_bin_U	±0.07	±0.00	00.00 # +	100.00	±0.0±	00.00 +	10.00 1	±0.00	00.01 +0	±0.00	±0.00	00.01 +
γ -suspermentation λ - ν λ - λ	±0.04	00.01	00.0 H	0.00	00.01 +0.00	±0.00	000 H	+0.00	00.01 +0.00	00.01	0000 +0.00	0000 + 0000
γ _shape_mcstat_ $H_VR_obs_BDTG_bin_0$	± 0.01	十0.00	±0.00	±0.01	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
α -syst WWXsec	± 0.01	± 0.00	± 0.00	± 0.00	± 0.01	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
α -systtZXsec	± 0.01	± 0.01	±0.00	±0.00	±0.00	±0.00	±0.00	十0.00	±0.00	± 0.00	±0.00	± 0.00
a_systWZXsec	±0.01	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.01	±0.00	±0.00	±0.00	±0.00	+0.00
γ_snape_nicstat_tz_t n_ous_DUIG_DUIL_ ~ shane mostat ZZ VR obs RDTC hin 0	00.0H		80.0 H H	00.0H		00.0H	B 0	00.04			00.0H	00.0H
restZZXsec	+0.00	+0.00	+0.00 +	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat- DY - VR -obs-BDTG-bin-0	土0.00	土0.00	土0.00	土0.00	±0.00	土0.00	土0.00	±0.00	±0.00	土0.00	土0.00	±0.00
γ _shape_mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW_SR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_ttW + ttZ + ttWW_CR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	+0.00	±0.00	±0.00	+0.00
7_shape_mcstat_ZZ_CK_obs_BDTG_bin_0	00.01 +0.00	00.01 1 −	0.0 # +	10.00 1	00.01 +0.00	00.0 1 1 0 0 0 0 1	00.0 1 1 0	±0.00	00.0 1 1 0 0 0 1	00.01 1	±0.00	00.01 +
\sim shane mostat tZ SR obs BDTG bin 0	+0.00	00.01	0.00+	+0.00	+0.00	+0.00	0.00+	0000++	+0.00	+0.00	+0.00	+0.00
γ -shape-mestat- WW - CR -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape_mcstat_ $DY_SR_{obs}BDTG_{bin_0}$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ _shape_mcstat_Z_CR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_H_CR_obs_BDTG_bin_0	土0.00	土0.00	土0.00	土0.00	±0.00	± 0.00	± 0.00	十0.00	±0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $Wt_CR_obs_BDTG_bin_0$	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- tt_CK -obs_BDTG-bin_0	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	00.0 ₩	±0.00	±0.00	±0.00	±0.00	±0.00
7_Shape_mestat_ <i>tt_D</i> _t_obs_DD_1G_DII_U	00.0H		00.01 H H	00.0H	00.01	00.0H	00.04			00.0H	00.0H	00.0H
γ shape most at $WZ CR$ obs BDTC bin 0	00.01 +0.00	00.01	8.0 H +	00.04	00.04	00.04	00-0+	00.01	00.04		00.04	00.0+
γ -shape-mostat- $tZGR_{-}$ obs_BDTG_bin_0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat- WW - SR -obs-BDTG-bin-0	± 0.00	± 0.00	±0.00	±0.00	± 0.00	± 0.00	±0.00	±0.00	± 0.00	± 0.00	±0.00	± 0.00
γ -shape-mcstat- Wt - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-H-SR-obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_Fakes_SR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $Fakes_CR_obs_BDTG_bin_0$	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	± 0.00
γ_shape_mcstat_ZZ_SR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
\sim shane mostat $DY CR$ obs BDTC bin 0	00.00+	00.0 1						+000				

Table 40: Breakdown of the dominant systematic uncertainties on background estimates in VR_3^{SF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Total background expectation	941 08	0.09	10.67	0.34	9.39	1.64	2.92	1.67	16.07	24.11	174.17	0.00
	00.11											
Total background error	±36.77	± 0.10	± 4.56	± 0.09	± 1.39	± 0.54	± 0.70	± 0.40	土4.14	± 13.20	± 27.69	±0.00
CellOut energy scale	± 19.47	± 0.00	± 2.55	± 0.02	± 0.46	± 0.03	± 0.04	± 0.03	± 1.85	± 1.83	± 12.66	± 0.00
sec	± 17.42	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	土0.00	土0.00	± 17.42	± 0.00
	± 13.70	±0.00	± 1.16	± 0.02	± 0.22	± 0.06	± 0.04	± 0.04	± 0.11		± 10.02	±0.00
	± 11.44	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00		±0.00	±0.00
Jet energy scale	±8.92	±0.01	±1.34	±0.04	10.0±	±0.04	±0.10	10.01	±1.03		11.2 1	±0.00
a_trigger	±7.23 ±6.07	00.0 1 1	±0.32	T0.01	±0.28	60.0 1 1 0	±0.09	00.01 00.01	10.00 10.00	7.0∓	±0.23 ±6.07	00.0 1 1 1 0 0 1
a tiGenerator	- 6.07 +6.68	8.0				8.0		00.0T	00.04	0.01		
Jet energy resolution	+5.84	+0.01	+0.67	+0.02	+0.33	+0.18	+0.18	+0.06	+0.05	+0.75	+6.23	+0.00
γ shape-mestat $t\bar{t}\bar{t}VR_{-}$ obs-BDTG-bin-0	+4.70	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+4.70	+0.00
$\alpha_{-1} VF$	+4.40	+0.00	+0.26	+0.01	+0.58	+0.07	+0.04	+0.01	+0.53	+1.38	+1.53	+0.00
a_svstZXsec	± 3.62	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	+0.00	± 0.00		± 0.00	± 0.00
γ -shape-mcstat- $DY_VR_obs_BDTG_bin_0$	± 3.26	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 3.26		± 0.00	± 0.00
CellOut energy resolution	± 2.80	± 0.01	± 0.85	± 0.02	± 0.10	± 0.03	± 0.04	± 0.01	± 0.23		± 3.75	± 0.00
γ -shape-mcstat- $WtVR$ obs-BDTG-bin_0	± 2.27	± 0.00	± 2.27	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00
$lpha$ _systWtXsec	± 2.13	± 0.00	± 2.13	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00
Lumi	± 1.87	± 0.00	± 0.30	± 0.01	± 0.26	± 0.05	± 0.08	± 0.05	± 0.45	± 0.67	± 0.00	± 0.00
γ -shape-mcstat-Z-VR_obs_BDTG_bin_0	± 1.86	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	土0.00	± 1.86	± 0.00	土0.00
	± 0.67	±0.00	±0.00	±0.00	± 0.67	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ _shape_mcstat_W W_V Lobs_BUTG_bin_U	± 0.64	±0.00	± 0.00	±0.00	± 0.64	#0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00
a_ttlSRFSR	± 0.57	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.57	±0.00
a_systW W A sec	±0.47	00.0 1 1	± 0.00	±0.00	±0.47	±0.00	± 0.00	±0.00	±0.00	00.0∏	±0.00	±0.00
$\alpha_{-} \Delta \omega_{-} \omega_$	H0.40					07-01-	H 0.00	10.00 10.00	00.0H	00.0H	00.0H	
\sim shane mostat $WZ VB$ ohs BDTG hin 0	+0.44	000+	0.00+	00.01 +0.00	00.01	00.0+	+0.44	00.0+	00.0+	00.01 +0.00	00.01+	00.01
α -systTplusXsec	+0.37	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.37	+0.00	+0.00	+0.00	+0.00
α -systWZXsec	± 0.20	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.20	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ _shape_mcstat_ZZ_VR_obs_BDTG_bin_0	± 0.16	± 0.00	± 0.00	± 0.00	± 0.00	± 0.16	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_t $tW + t\bar{t}Z + t\bar{t}WW_VR_obs_BDTG_bin_0$	± 0.12	土0.00	±0.00	土0.00	± 0.00	±0.00	± 0.00	± 0.12	± 0.00	±0.00	± 0.00	± 0.00
α -syst TX sec	± 0.09	±0.09	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00
a_systZZXsec	±0.08	±0.00	±0.00	±0.00	±0.00	±0.08	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ_shape_mcstat_H_V K_obs_BUTG_bin_0	±0.06	00.0∓	±0.00	±0.06	±0.00	00.0 1	±0.00	±0.00	±0.00		±0.00	±0.00
γ_snape_mcstat_t∠_V n_ods_DUIG_DUIG_DUIG_0	70.07	70.07 H H						10.00	00.0H		00.0H	
\sim shape mostat $Fakes VB$ obs BDTG hin 0	+0.00	000+	0.00+	00.01 +0.00	00.01	00.0+	0.00+	00.0+	00.0+		10.01	00.01
γ -shape-mestat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW - SR_{obs}$ BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00
γ -shape-mcstat- $ZZ_CR_obs_BDTG_bin_0$	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00
γ -shape-mcstat- WZ - SR -obs-BDTG-bin-0	± 0.00	土0.00	土0.00	± 0.00	± 0.00	土0.00	± 0.00	土0.00	± 0.00		± 0.00	土0.00
γ -shape-mcstat_ $LZ_SR_obs_BDTG_bin_0$	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ _shape_mcstat_W W_CK_obs_BD'IG_bin_0	±0.00	00.0 ₩	±0.00	±0.00	±0.00	00.0 ₩	±0.00	±0.00	±0.00		±0.00	±0.00
γ shape_mostat_DI_D_D_D_D_D_D_D_D_D_D_D_D_0 2. shana mastat 7 CB ake RDTC kin 0								10.00	00.04		00.0H	
\sim share mostat H CR obs BDTC him 0		800+	000+	000+	000+	8.04	000+	0000+	000+			000+
\sim shape mostat $W + CR$ obs BDTG bin 0	00.0+	000	000+	00.0+	000+	000+	00.0+	00.0+	00.0+	000+	00.0+	000+
α -FakesSvst	$\pm 0.00 \pm$	+0.00	+0.00	+0.00	+0.00	± 0.00	± 0.00	± 0.00	± 0.00	+0.00	± 0.00	+0.00
γ -shape_mcstat_ $t\bar{t}$ _ $SR_obs_BDTG_bin_0$	±0.00	±0.00	±0.00	土0.00	+0.00	+0.00	+0.00	±0.00	±0.00	±0.00	±0.00	+0.00
γ -shape-mcstat-Z-SR-obs-BDTG-bin-0	土0.00	土0.00	土0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	土0.00
γ -shape-mcstat- $t\bar{t}$ - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00
γ -shape-mcstat- WZ - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00
γ -shape-mcstat- tZ - CR -obs-BDTG-bin-0	± 0.00	土0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	土0.00	± 0.00	土0.00
γ -shape-mcstat-H_SR_obs_BDTG_bin_0	土0.00	土0.00	土0.00	土0.00	± 0.00	土0.00	± 0.00	土0.00	土0.00	土0.00	± 0.00	土0.00
γ -shape-mcstat- WW - SR -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- Wt - SR -obs-BDTG-bin-0	± 0.00	土0.00	土0.00	土0.00	± 0.00	±0.00	± 0.00	土0.00	± 0.00	±0.00	± 0.00	± 0.00
γ -shape-mcstat- $Fakes_SR_obs_BDTG_bin_0$	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ_shape_mestat_ <i>Fakes_CK_</i> obs_BDTG_bm_0	±0.00	00.0∏	00.0∏	00.01 +	00.01 +0	00.0 1 1 0 0	± 0.00	±0.00	00.0∏ +		00.00 1 ± 0.00	00.0 + 000 +
v shape mostat ZZ SR obs BDTC bin 0	00 0H	00.0H		00.0H	0000+	00-0+	0000 H +	00.01 +0.00	00.01 +0.00	00.0H	00.04	0000+

Table 41: Breakdown of the dominant systematic uncertainties on background estimates in VR_4^{SF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Total background expectation Total background error	1	0.09	10.70	0.34	9.40	1.64	2.92	1.67	16.08	24.20	193.69	0.00
Total background error	260.75						1					
	土27.18	± 0.10	土4.55	± 0.08	± 1.39	± 0.54	土0.70	± 0.40	± 4.13	± 13.12	± 16.13	±0.00
$mu_t \bar{t}SF$	± 27.06	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 27.06	± 0.00
gy scale	± 20.78	±0.00	± 2.54	± 0.02	± 0.46	± 0.03	± 0.04	± 0.03	± 1.84	± 1.82	± 14.00	±0.00
α_systut Asec	± 19.18	00.04 +	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	00.00 +	±0.00	± 19.18	±0.00
arriteOp A ZCanarator	± 11.36	8.04		10.01	77.0T	0.04	+0.04		01.01 +	97.11 36	00.011	
Jet energy scale	+010	0.07 10 04	+1.34	+0.04	20.04	00-0+	+0.10	+0.01	+1.52	+3 90	+ 2 33	0000+
ou chuigy scane A triager	22.24	10.01	+0.32	10.0+	+0.28	10.05	0100+	+0.05	+0.48	+0.72	+5.77	+0.00
α -tipsci α -tiPartonShower	+7.69	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+7.69	+0.00
$\alpha_{-t\bar{t}}$ Generator	± 7.38	±0.00	±0.00	土0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	土7.38	土0.00
Jet energy resolution	± 6.50	± 0.01	± 0.67	± 0.02	± 0.32	± 0.18	± 0.18	± 0.06	± 0.05	± 0.74	± 6.89	土0.00
γ -shape-mcstat- $t\bar{t}$ - VR -obs-BDTG-bin-0	± 5.22	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 5.22	± 0.00
α -JVF	± 4.54	± 0.00	± 0.26	± 0.01	± 0.57	± 0.07	± 0.04	± 0.01	± 0.53	± 1.37	± 1.69	± 0.00
α -systZXsec	± 3.61	土0.00	土0.00	±0.00	土0.00	±0.00	土0.00	十0.00	土0.00	± 3.61	±0.00	土0.00
γ _shape_mcstat_ $DY_VR_obs_BDTG_bin_0$	± 3.26	十0.00	±0.00	±0.00	±0.00	±0.00	±0.00	十0.00	± 3.26	±0.00	±0.00	±0.00
CellOut energy resolution	± 3.20	± 0.01	± 0.85	± 0.02	± 0.10	±0.03	± 0.04	±0.01	± 0.22	± 0.20	± 4.15	±0.00
γ -snape_incsvav_W v_V v_ODS_DD I G_DIN_U $\sim \text{svst}W/4 \text{ X}$ sec	H 4.70 H 713 H 717		H 4.40 H 2.10 H 4.40	00.04	00.0H		00.0 H +	00.0H	00.0H	00.0 H +	00.0H	00.0H
Lumi	+1.87	+0.00	+0.30	+0.01	+0.26	+0.05	+0.08	+0.05	± 0.45	+0.67	+0.00	+0.00
γ -shape-mcstat-Z-VR-obs-BDTG-bin-0	± 1.87	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 1.87	± 0.00	± 0.00
$\alpha_{-t\bar{t}}$ ISRFSR	± 1.17	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 1.17	± 0.00
	± 0.67	±0.00	±0.00	±0.00	± 0.67	±0.00	±0.00	十0.00	±0.00	±0.00	±0.00	±0.00
γ _shape_mcstat_W W_V A_obs_BD'I'G_bin_0	±0.64	±0.00	±0.00	±0.00	±0.64	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
α_systw w Asec Λ ZZCenerator	±0.47	00.04	00.0H	00.0H	±0.4/	10.00 +0.46	00.0 H +	00.0H	00.0H	00.0H	00.0H	00.0H
$\alpha_{-W}ZGenerator$	± 0.45	±0.00	±0.00	±0.00	±0.00	+0.00 +	± 0.45	+0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- WZ - VR -obs-BDTG-bin-0	± 0.44	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.44	± 0.00	± 0.00	土0.00	± 0.00	± 0.00
α -systTplusXsec	± 0.37	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	土0.00	± 0.37	± 0.00	土0.00	± 0.00	土0.00
α -systWZXsec	± 0.20	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.20	±0.00	±0.00	±0.00	土0.00	±0.00
γ -shape-mestat- ZZ_VR -obs-BDTG-bin-0	± 0.16	±0.00	±0.00	±0.00	±0.00	± 0.16	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
	71.0T	00.04	0000+	0000+	0000+	000	0000+	71:07 +0 00	0000+	00.04	00.0+	00.0+
α -systZZXsec	± 0.08	±0.00	±0.00	±0.00	±0.00	±0.08	土0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ _shape_mcstat_H_VR_obs_BDTG_bin_0	± 0.06	± 0.00	± 0.00	± 0.06	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $tZ_VR_obs_BDTG_bin_0$	± 0.02	± 0.02	± 0.00	土0.00	土0.00	± 0.00	± 0.00	±0.00	± 0.00	土0.00	± 0.00	土0.00
	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- $ttW + ttZ + ttW W - SK_{-}$ obs-BUTG-bin-U	00.0 1 1 0 0 1	00.04 1	00.0 1 ± 0.00	00.0 1 1 1 0 0 0 1	00.0 1 1 1 0 0 0 1 0 0 0 1	0.0 1 1 1	00.0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	±0.00	00.04 1	00.0 ₩ +	00.01 +000	00.0 1 1 1 0 0 0 1
γ -shape_mustat_ <i>it W</i> + <i>it \Let V V</i> = <i>U</i> M_005-DD 1G_DIII_0 \sim shape mostat ZZ <i>CR</i> obs RDTC bin 0	00.0H		00.0H		00.0H		00.0 H H	00.04	00.0H	00.0H	00.04	
γ -shape-mestat- WZ_SR_{obs} -BDTG-bin_0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	± 0.00	+0.00
γ _shape_mcstat_tZ_SR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ _shape_mcstat_WW_CR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_ $DY_SR_{obs}BDTG_{bin_0}$	土0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	十0.00	±0.00	±0.00	± 0.00	±0.00
γ -shape-mcstat-Z-CR-obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ-shape-mcstat-H-CK-obs-BDTG-bin-0	±0.00	00.0 1 0	± 0.00	±0.00	±0.00	00.0 ₩	± 0.00	±0.00	±0.00	±0.00	00.00 +	±0.00
γ -shape_micstat $t\bar{t}$ CR obs BDTG bin 0	00.0H		0000 H		00.0H		00.0 H +	+0.00	00.0H	00.00 H +	00.01 +0.00	00.0H
α -FakesSvst	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	+0.00	±0.00
γ -shape-mcstat- $t\bar{t}$ - SR -obs-BDTG-bin-0	土0.00	土0.00	土0.00	土0.00	土0.00	十0.00	土0.00	±0.00	土0.00	±0.00	±0.00	土0.00
γ -shape-mcstat-Z-SR-obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- WZ - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ _shape_mcstat_tZ_CR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	土0.00	土0.00	± 0.00	± 0.00	±0.00	± 0.00	土0.00	± 0.00	土0.00
γ -shape-mcstat- $WWSR_obs_BDTG_bin_0$	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- $W t_S R_{obs}$ -BDTG-bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ_shape_mcstat_H_SK_obs_BD'IG_bin_0	±0.00	00.0 1 0	± 0.00	±0.00	±0.00	00.0 ₩	± 0.00	±0.00	±0.00	±0.00	00.00 ₩	±0.00
γ-shape_mcstat_ <i>Fakes_SK</i> _obs_BDTG_bin_U	00.0 1 1 1 0 0 1 1	00.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	00.0 + 0 00 + 0 00 + 0 00 + 0 00 + 0 00 + 0 00 + 0 00 + 0 +	00.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	00.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0.0 1 1 1 1	00.0 ₩	±0.00	00.0#	00.0 1 1 1 0	00.0∓	00.0 1 1 1 0 0 0 1 1
\sim shape mostat $DY CR$ obs BDTG hin 0	0.01+	00.01	+0.00	0000+	00.01 +0.00	00.0+	0000 + 0000	00.01+	+0.00	00.01 +0.00	00.0+	00.0+
γ -shape-mestat-ZZ-SR-obs-BDTG-bin-0	十0.00	十0.00	十0.00	土0.00	±0.00	±0.00	十0.00	±0.00	十0.00	±0.00	±0.00	十0.00

Table 42: Breakdown of the dominant systematic uncertainties on background estimates in VR_4^{SF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

	Q											
Total background expectation	2021.95	0.23	112.96	1.61	61.89	3.60	10.27	6.32	35.53	80.71	1708.83	0.00
Total background error	± 244.83	± 0.23	± 24.35	± 0.26	± 24.66	± 1.65	± 1.36	± 1.44	± 9.72	± 27.56	± 231.42	±0.00
α -syst $t\bar{t}\bar{t}$ Sec	± 170.88	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 170.88	± 0.00
α -ttGenerator	± 109.34	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 109.34	00.01
CellOut energy scale	± 71.58	±0.01	±0.09	± 0.12	± 1.50	± 0.01	± 0.21	±0.06	± 5.91	± 12.37	± 51.50	00.0 00.0 0 0 0 0 0 0 0 0 0 0 0 0 0
a_rrrartonSnower	1 00.30 - 20.60	±0.01	00.0 1 - 00.0	10.0U	±0.00	± 000	±0.00	10.00	10.01 10.01	± 0.00	H08.30	0.0 ₩
a_trigger	00.00H	10.01	H 0.03	60.0H	00 01 H	TT-0 H	HU.31	10.19 10.19	10.1H	H 4.42	17.10H	00.0H
Jet energy resolution	± 49.72	±0.02	90.0 ∓	±0.02	±2.88	± 0.40	±0.51	±0.09	±3.50	±9.44	±39.36	00.0 ₩
a-WW Generator	123.01 - 20.50	00.0∏	1 00.01	00.0∏	10.001	00.0 1 −	00.0∏	±0.00	00.0 1 1	00.0 1 −	00.0∏	0.0 ₩
	H 22.09	00.0H	H 44.09	00.0H-	00.0H-	00.0 H	00.0H	H0.00	00.0H-	00.0H-	10.00	0.04 H -
Jet energy scale	H 22.38	10.01 1	H 1.45	±0.09	12.73 10.96	10.U3	10.3U	10.01 +0.03	±2.94	H 3.39	±24.01	00.0 ₩
α_FIIeUp 2. TVF	10.00 11.00 11.00	70.07	±1.49	10.0H	HU.30	01.0 H	10.04	HO OO	67.0H	6 с с Н Н Н Н	10.01 10.01	00.0H
	±14.91	±0.01	H 1.03	±0.02	10.00 10.00	±0.13	±0.12	±0.00	±0.23	77.7 T	±8.49	00 ₩
γ -snape-mcstat-tt-V π -ops-bU I Θ -pin-0	± 14.73	00.0∏	00.0 ₩	00.0∏	00.0∏	00.0 1 −	00.0∏	±0.00	00.0 1 1	111.00	±14.73	0.0 ₩
	H 14.07		00.04 H +	00.0H	00.04	00.0 H +	00.04			H 14.0/	00.0H	8.0 H +
Lago Lago Lago Lago Lago Lago Lago Lago	122 8 +	0.04	+ 20.00	0.04	+ 1 7 3	010	00.04	+ + 0.00	00.04		00.0+	8.04
\sim shane mostat $W + VR$ obs BDTC hin 0			00.94	500+			000+	01.01	000+	+0.00		000+
\sim shape mostat Z VR obs BDTG bin 0	+5.79	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+5.79	+0.00	+0.00
$\gamma_{\rm shape-mcstat}DY_VR_{\rm obs}BDTG_{\rm bin}0$	± 4.51	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 4.51	± 0.00	± 0.00	土0.00
$\alpha_{-t\bar{t}}$ ISRFSR	± 3.76	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 3.76	± 0.00
lpha-syst WW Sec	± 3.09	± 0.00	± 0.00	± 0.00	± 3.09	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $WWVR$ obs-BDTG_bin_0	± 1.61	± 0.00	±0.00	± 0.00	± 1.61	± 0.00	±0.00	十0.00	± 0.00	±0.00	土0.00	±0.00
$\alpha Z Z Generator$	± 1.55	±0.00	±0.00	±0.00	±0.00	± 1.55	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
arsyst I plus X sec	± 1.39	±0.00	±0.00	±0.00	±0.00	+0.00	±0.00	±1.39	±0.00	±0.00	±0.00	00.0 ₩
γ -snape-mcstat- V Z_V Z_V R_0 05- BU G_0 $Din-0$	0.70 10.70	00.0 1 1 1 1 0 0	00.0 H H	00.0∏	00.0∏	00.01 1	10.70 10.70	10.00 +0.00	00.0	00.0 1 +	00.01 +0.00	00.0 ₩
Collout anorary measuration	H0.12		10.01 10.01	10.00	10.00 10.33		71.0H		H0.00	10.01	10.00	
$\alpha_{-W}Z$ Generator	± 0.41	±0.00	+0.00 +	±0.00	±0.00	+0.00	± 0.41	±0.00	±0.00	±0.00	+0.00	±0.00
γ -shape-mcstat-ZZ-VR_obs_BDTG_bin_0	± 0.23	± 0.00	± 0.00	± 0.00	± 0.00	± 0.23	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
α -systtZXsec	± 0.23	± 0.23	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW_VR_obs_BDTG_bin_0$	± 0.23	土0.00	±0.00	±0.00	土0.00	± 0.00	±0.00	± 0.23	土0.00	土0.00	土0.00	土0.00
γ -shape-mcstat- $H_V R_{obs}BD^T G_{bin-0}$	±0.19	±0.00	±0.00	± 0.19	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
arsystddAsec	81.0 H	00.0∏	00.0 1 1	00.0 1 1	00.0∏	81.0H	00.0∏	10.00 1	00.0 1 1 1 0 0 0 1	00.0 1 + 0.00	110.00	00.0 ₩ +
mu_uziar 20 shana mostat 47 VR ahs RDTC hin O	10.03	00.0H	8.0 H +				00.0H		00.0H	00.0 H +	1.01 1.01	B 0
\sim shape mostat Fakes VR obs BDTG him 0	0000+	0000+	00.0+	0.00+	+0.00	+0.00	+0.00	00.01+	+0.00	+0.00	00.0+	0000+
γ -shape-mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW_{-}SR_{-}obs_BDTG_{-}bin_{-}0$	+0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	+0.00	+0.00
γ -shape-mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW$ _ CR _obs_BDTG_bin_0	± 0.00	+0.00	±0.00	+0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat-ZZ_CR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- WZ - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- tZ - SR -obs-BDTG-bin-0	± 0.00	土0.00	±0.00	±0.00	土0.00	±0.00	土0.00	±0.00	土0.00	土0.00	±0.00	土0.00
γ -shape-mcstat- $WWCR$ obs_BDTG_bin_0	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- DY -SK-obs-BDTG-bin-0	±0.00	±0.00	# 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	# 0.00
γ-snape-mostat-Δ-C/Λ-ODS-DD I G-DDTC his D	00.0H		8.0 H H									B 9
U "Y-2119/2017/17-2017/17-2017/2017/2017/2017/2017/2017/2017/2017/												
7-211aperators V 1-0 11-002-D I G-DIII-0	00.0+	00.04	0.0	00.0+	00.04	000+	00.0+	00.01+	00.0+	00.0+		8.0+
α_{-L} unescript $t^{-}_{L} CR$ obs $RDTC$ bin 0			8.0	00.04								8.0
~ share mostat Z SR obs BDTG hin 0	00.0+	+0.00	000	000+	+0.00	000+	000+	00.0+	+0.00	+0.00	00.0+	000+
\sim shape mostat $t\bar{t}$ CR obs BDTG bin 0	+0.00	+0.00	00.00+	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
γ -shape-mestat- $WZ_CR_obs_BDTG_bin_0$	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat- tZ - CR -obs-BDTG-bin-0	±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	一 00.00	± 0.00	± 0.00	±0.00	±0.00
$\gamma_{-shape-mcstat-H-SR_obs-BDTG-bin_0}$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $WW_SR_{obs}BDTG_{bin_0}$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- Wt - SR -obs- $BDTG$ -bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $Fakes$ - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ $Fakes_CR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- DY - CR -obs-BDTG-bin-0	± 0.00	土0.00	±0.00	±0.00	土0.00	± 0.00	±0.00	土0.00	土0.00	土0.00	土0.00	土0.00
γ -shape-mcstat-ZZ-SR-obs-BDTG-bin-0	±0.00	00.00 #						+0.00				

Table 43: Breakdown of the dominant systematic uncertainties on background estimates in VR_5^{SF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Uncertainty of channel	VR_5^{SF}	tZ	2 11	-		1	1	M M 11 + 711 + M 11		1		
Total background expectation	2056.37	0.23	112.97	1.61	61.91	3.61	10.28	6.32	35.53	80.72	1743.20	0.00
Total background error	± 106.63	± 0.23	± 24.20	± 0.26	± 24.50	± 1.64	± 1.36	± 1.43	± 9.68	± 27.39	± 105.44	±0.00
$mu_{-}t\bar{t}SF$	± 241.37	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 241.37	± 0.00
α -syst tt Xsec	± 172.90	±0.00	±0.00	土0.00	±0.00	土 0.00	土0.00	十0.00	±0.00	±0.00	± 172.90	±0.00
α_{-tt} Generator	± 110.81	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	± 110.81	±0.00
CellOut energy scale	17.7/ HE0.0E	T0.01	80.04 +	1000 100 100 100 100 100 100 100 100 10	±1.49	10.01 H	17.04	10.00 +0.00	H0.08	± 12.32	107.73 160.05	00.0 ₩ +
atrianar مراجع المراجع	±03.20 +61.26	0.0H	10.01 1 3 37	00.0H	1 8 1 H	0.0 1	00.0H	10 10	100.01 +1.06	100.01 + 2 40	+51 03	
u-uiggei Jet energy resolution	+50.17	+0.02	90.0+	+0.02	+2.86	+0.40	+0.51	61.04	+3.47	+ 0.38	+39.88	00.0+
$\alpha_{-}WW$ Generator	+23.66	+0.00	+0.00	+0.00	+23.66	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
Jet energy scale	+22.73	± 0.01	± 1.43	± 0.09	± 2.73	± 0.05	± 0.30	± 0.07	± 2.93	± 3.37	± 24.36	± 0.00
α -syst W tX sec	± 22.44	± 0.00	± 22.44	± 0.00	± 0.00	± 0.00	± 0.00	十0.00	± 0.00	± 0.00	± 0.00	± 0.00
α -PileUp	± 15.79	± 0.02	± 1.48	± 0.01	± 0.36	± 0.10	± 0.07	± 0.03	± 3.76	± 9.82	± 0.58	± 0.00
$\alpha_{-t\bar{t}}$ ISRFSR	± 15.36	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	十0.00	± 0.00	± 0.00	± 15.36	± 0.00
γ -shape-mcstat_ $t\bar{t}$ _ VR -obs_BDTG_bin_0	± 15.03	±0.00	土0.00	土0.00	土0.00	土0.00	土0.00	十0.00	±0.00	± 0.00	± 15.03	±0.00
α -JVF	± 14.99	± 0.01	± 1.62	± 0.02	± 2.04	± 0.14	± 0.12	±0.00	± 0.23	± 2.21	± 8.61	±0.00
α_Z Generator	±14.47	±0.00	00.0±	±0.00	±0.00	± 0.00	00.0±	±0.00	±0.00	±14.47	±0.00	00.0 ₩ -
a_systzAsec Lumi	H 12.02 + 8 73	0.0H	H 10.00	H0.04	HU.UU +1 73	00-0 H +	00.0H	±0.00 +0.18	00.0H	+2.25	00.01+	8.0 H +
γ -shape-mcstat- $Wt_VR_{obs}BDTG_{bin_0}$	± 6.90	土0.00	± 6.90	土0.00	十0.00	土0.00	十0.00	土0.00	±0.00	±0.00	±0.00	十0.00
γ -shape-mcstat-Z-VR-obs-BDTG-bin-0	± 5.79	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	十0.00	± 0.00	± 5.79	± 0.00	± 0.00
γ -shape-mcstat- DY - VR -obs-BDTG-bin-0	± 4.51	±0.00	土0.00	土0.00	土0.00	土0.00	土0.00	十0.00	± 4.51	± 0.00	土0.00	±0.00
α -syst W W Xsec	± 3.08	±0.00	±0.00	±0.00	±3.08	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -snape-mestat_W W _V L 005_DU L G_DIN_U	10.1 + 1 5 1		00.0H		10.1H	± 0.00	00.0H		00.0H	00.04		00.0 H +
or syst Thus Xsec	± 1.38	+0.00	0.00 +0.00	+0.00	+0.00	± 0.00	+0.00	±0.00 +1.38	00.01 +0.00	+0.00	+0.00	00.00 +
γ -shape_mcstat_WZ_VR_obs_BDTG_bin_0	± 0.76	土0.00	十0.00	土0.00	土0.00	土0.00	土0.76	土0.00	±0.00	土0.00	±0.00	土0.00
α -syst WZX sec	± 0.71	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.71	十0.00	± 0.00	± 0.00	± 0.00	± 0.00
CellOut energy resolution	± 0.62	±0.01	± 2.55	±0.06	± 0.31	± 0.08	± 0.02	土0.07	± 1.35	± 0.07	± 4.34	±0.00
α_W Z Generator	± 0.40	00.0 + 00.00 +	00.0 1 1	±0.00	±0.00	±0.00	±0.40	±0.00	00.04 +	± 0.00	00.0∏	00.0 H +
γ-snape-nicstat-Δ-V A-00s-DD I G-010-0 α svsttZ X sec	± 0.23	±0.00	00-0 H +	0000 +0	00.0H	00.01 H	00.0H	00.0H	00.0H	0000+	00.0H	00.0 H +
$\gamma_{-\text{shape-mcstat}}$ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW_{-}VR_{-}\text{obs}_{-}BDTG_{-}\text{bin}_{-}0$	± 0.23	土0.00	十0.00	土0.00	土0.00	土0.00	土0.00	± 0.23	±0.00	土0.00	±0.00	十0.00
γ -shape-mcstat- H_VR_{obs} -BDTG_bin_0	± 0.19	± 0.00	± 0.00	± 0.19	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
α -systZZXsec	± 0.18	±0.00	±0.00	十0.00	±0.00	± 0.18	±0.00	十0.00	±0.00	± 0.00	±0.00	±0.00
γ-shape_mcstat_tZ_V R_obs_BDTG_bin_0	± 0.03	±0.03	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -snape_mcstat_ <i>F'akes_V K_</i> obs_ <i>BUTG_</i> bin_U \sim share mostat $t\overline{t}N \perp t\overline{t}Z \perp t\overline{t}NNN \leq R \circ h_{s}$ BDTC hin 0	00.0 1 1 1 0 0 0 0 1 1 0 0 0 1 1	00.0 1 1 0 0 0 0 1	0.0 ₩ +	00.0∓	00.0#	00.0 1 1 0 0 0 0 1 0 0 0 1 0 0 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	00.0 1 1 0 0 0 0 1 0 0 0 1	±0.00 +0.00	00.0	00.0 +	10.00 +	0.0 ₩
γ shape most at $t\bar{t}W + t\bar{t}Z + t\bar{t}WW - CR$ obs. BDTG bin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat-ZZ-CR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- WZ - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- tZ - SR -obs-BDTG-bin-0	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	0.00 ++
\sim shape mostat. DY SR obs BDTG him 0	+0.00	00.01	00.0+	0000 +0.000	00.01	0000+	00.0+	+0.00	00.0+	00.00+	00.01	0.00
γ -shape-mestat-Z-CR-obs-BDTG-bin-0	±0.00	±0.00	十0.00	十0.00	±0.00	±0.00	十0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- <i>H</i> - <i>CR</i> -obs-BDTG-bin-0	± 0.00	±0.00	± 0.00	土0.00	±0.00	± 0.00	土0.00	±0.00	± 0.00	± 0.00	±0.00	±0.00
γ -shape-mcstat- Wt - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_ $t\bar{t}$ _ $CR_obs_BDTG_bin_0$	± 0.00	± 0.00	土0.00	土0.00	土0.00	± 0.00	土0.00	十0.00	± 0.00	± 0.00	± 0.00	土0.00
α -FakesSyst	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	+0.00
γ -shape-mcstat_tt_SK_obs_BD'I'G_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	00.0 ₩
γ-shape_mcstat_Z_SK_obs_BDTG_bin_U	± 0.00	00.0 1 1 1 0 0 0 1	00.01 1	100.00 1	00.0∏ +	00.01 1 − 000	±0.00	±0.00	00.04 1	±0.00	00.01 +0.00	00.0 H +
γ -snape-mcstat-W Z-CK-ODS-DUI G-DIN-U \sim shape mostat $+Z$ CR obs RDTG bin 0	00.0 1 1	00.0H	00.0 H +	00.0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	00.0 1 1	00.0 H +	00.01 +	10.00 +0.00	00.0 1 1	00.0 +	00.0H	8.0 H
γ -shape mostat WW -SR-obs-BDTG-bin-0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat- Wt - SR -obs-BDTG-bin-0	±0.00	土0.00	十0.00	土0.00	土0.00	± 0.00	± 0.00	±0.00	±0.00	± 0.00	±0.00	±0.00
γ -shape-mcstat-H-SR-obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $Fakes$ - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $Fakes$ - CR -obs- $BDTG$ -bin-0	± 0.00	土0.00	土0.00	土0.00	土0.00	± 0.00	土0.00	十0.00	± 0.00	± 0.00	± 0.00	土0.00
γ -shape-mcstat- DY - CR -obs_BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat-ZZ_SR_obs_BDTG_bin_0	± 0.00	± 0.00	±0.00	±0.00	±0.00	00 ^{.00}	+0.00	± 0.00	00.00 #	+0.00	00.0+	+0.00

Table 44: Breakdown of the dominant systematic uncertainties on background estimates in VR_5^{SF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Uncertainty of channel	SH1	2						-				
Total background expectation	5.37	0.00	0.37	0.01	0.00	0.00	0.00	0.13	0.00	0.29	4.56	0.00
Total background error	± 2.05	±0.00	± 0.49	± 0.01	土0.11	± 0.00	± 0.00	土0.05	土0.00	± 0.33	± 1.86	±0.00
	± 1.33	土0.00	土0.00	± 0.00	土0.00	土0.00	± 0.00	±0.00	土0.00	土0.00	± 1.33	土0.00
γ _shape_mcstat_tt_SR_obs_BDTG_bin_0	± 0.86	±0.00	±0.00	土0.00	±0.00	±0.00	十0.00	土0.00	±0.00		± 0.86	±0.00
Jet energy scale	±0.79	±0.00	±0.00	±0.00	±0.02	±0.00	± 0.00	± 0.02	±0.00		±0.69	±0.00
Jet energy resolution	±0.73	00.0 1 1	H 0.32	00.0 1 ± 0.00	70.07 +0	00.0 1 1	00.01 H H	10.01	00.0 1 1 1 0	10.03	±0.44	00.01 1
α_systerAsec ~ shane mrstat W/+ SR ohs RDTG hin 0	±0.40	00.04	10.00 140 37	00.0H	00.04	00.04	00.04	00.00 +	00.04	00.0H	+0.01	00.0H
2 Contrator	000+	000+	000+	+0.00	000+	0000+	0000+		+0.00		000+	000++
or tilsBFSR	+0.25	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00+	+0.00		+0.25	+0.00
$\alpha_{-}WW$ Generator	+0.11	±0.00	±0.00	± 0.00	± 0.11	±0.00	±0.00	±0.00	±0.00		+0.00	±0.00
a_PileUp	± 0.10	±0.00	± 0.03	+0.00	±0.00	±0.00	+0.00	± 0.00	± 0.00		± 0.11	± 0.00
\sim shape mostat Z SR obs BDTG bin 0	+0.09	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00
CellOut energy resolution	+0.08	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	00.01+	+0.00		+0.10	+0.00
o svst W t X sec	20.04	+0.00	+0.07	+0.00	+0.00	+0.00	+0.00	00 0+	00.0+		+0.00	+0.00
or syst Z X sec	+0.04	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	00.01+	+0.00		+0.00	+0.00
$\sim shape_mcstat_t\bar{t}W + t\bar{t}Z + t\bar{t}WW_SR_obs_BDTG_bin_0$	+0.03	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.03	+0.00		+0.00	+0.00
$\alpha \operatorname{syst} T \operatorname{plus} \operatorname{Sec}$	+0.03	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00		+0.00	+0.00
a.JVF	+0.03	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00		+0.03	+0.00
Lumi	+0.02	+0.00	+0.01	+0.00	+0.00	+0.00	+0.00		+0.00		+0.00	+0.00
\sim -shape-mcstat- HSR obs-BDTG-bin-0	+0.01	+0.00	+0.00	+0.01	+0.00	+0.00	+0.00		+0.00		+0.00	+0.00
	00.0+	+0.00	+000	+0.00	+0.00	+0.00	+0.00		+0.00		+0.06	+0.00
or svsttZXsec	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00
\sim shape mostat tZ SR obs BDTG hin 0	00.0+	+0.00	+000	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00
t_{t} multiple	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00		+0.00	+0.00
or syst W ZXsec	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00		+0.00	+0.00
$lpha_{ m syst}WWX$ sec	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
$\alpha_{-syst}ZZ$ xsec	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
$\gamma_{shape_mcstat_WW_SR_obs_BDTG_bin_0}$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
γ -shape-mcstat- WZ - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00		± 0.00	± 0.00
γ -shape-mcstat- $Fakes$ - SR -obs- $BDTG$ -bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- DY - SR -obs- $BDTG$ -bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00
γ -shape_mcstat_ZZ_SR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00		±0.00	±0.00
$\alpha_Z Z Generator$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
γ -shape-mcstat- Wt - CR -obs-BDTG-bin-0	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00			± 0.00
γ -shape_mcstat_tt_CR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00			±0.00
γ -shape_mcstat_WZ_CR_obs_BDTG_bin_0	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00		±0.00	±0.00
γ -shape_mcstat_ DY _ CR_{obs} _BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	00.00	00.00	00.01		±0.00		±0.00	±0.00
γ -shape_mcstat_ttW + ttZ + ttWW_VR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00		±0.00	±0.00
γ -shape-mcstat- $WZ-VR$ -obs-BDTG-bin-0	± 0.00	±0.00	± 0.00	± 0.00	±0.00	± 0.00	±0.00		± 0.00		±0.00	± 0.00
γ -shape-mcstat-tt_VR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
γ _shape_mcstat_tZ_VR_obs_BDTG_bin_0	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
γ -shape_mcstat_ZZ_VR_obs_BDTG_bin_0	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00		±0.00	±0.00
αWZ Generator	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
γ -shape-mcstat- DY_VR_obs -BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
$lpha$ _FakesSyst	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW_{-}CR_{-}obs_{-}BDTG_{-}bin_{-}0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $H_CR_{obs}BDTG_{bin-0}$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\gamma_{\rm shape-mcstat-Z-VR-obs-BDTG-bin-0}$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
γ -shape-mcstat- WW - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ $tZ_CR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
γ -shape-mcstat-ZZ-CR-obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
γ -shape-mcstat- $WW_VR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $H_VR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
γ -shape_mcstat_Fakes_CR_obs_BDTG_bin_0	+0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		+0.00		± 0.00	± 0.00
\sim shape-mostat-Z-CR-obs-BDTG-bin-0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00		+0.00	+0.00
γ shape mostat $Wt VR$ obs BDTG bin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00		+0.00	+0.00
\sim shane mostat $Fake \in VR$ obs BDTG hin 0	000+		000+		000+	+0.00						
							ł					

Table 45: Breakdown of the dominant systematic uncertainties on background estimates in SR_1^{SF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Uncertainty of channel	1.12							1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				
Total background expectation	4.07	0.00	0.37	0.01	0.00	0.00	0.00	0.13	00.00	0.29	3.26	0.00
Total background error	± 1.45	±0.00	土0.49	± 0.01	± 0.11	±0.00	土0.00	± 0.05	±0.00	± 0.33	± 1.25	±0.00
α -třGenPlusPS γ -shape-mcstat_tř_SR_obs_BDTG_bin_0 Jet energy resolution Jet energy scale	± 0.95 ± 0.61 ± 0.60 ± 0.58	10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00	± 0.00 ± 0.00 ± 0.31 ± 0.00	土 10.00 10.00 10.00 10.00	±0.00 ±0.00 ±0.02	10.00 10.00 10.00 10.00 10.00 10.00 10.00	00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00	土0.00 土0.00 土0.01 土0.02	±0.00 10.00 10.00 10.00		± 0.95 ± 0.61 ± 0.31 ± 0.49	10.00 10.00 10.00 10.00
$\mathrm{mu.ttDF}$ γ -shape_mcstat_ $Wt_SR_o\mathrm{bs}$ _BDTG_bin_0 α _systiftXsec	± 0.44 ± 0.37 ± 0.32	〒 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:	±0.00 ±0.37 ±0.00	十 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	±0.00 10.00 10.00	±0.00 10.00 10.00	# # 0.00 # # 0.00	±0.00 ±0.00 ±0.00	+0.00 +10.00 +10.00		± 0.44 ± 0.00 ± 0.32	±0.00 ±±0.00
α.ZGenerator α.tflSRFSR ω.WWGcanaretor	± 0.29 ± 0.15 ± 0.11	00.00 ++0.00 +	±0.00 ±±0.00 +	+ + 0.00 + + 0.00	±0.00 ±±0.00	00.00 + ±0.00	±0.00 +±0.00 +	十十 1000 1000 1000 1000	00.00 ++0.00	±0.29	± 0.00 ± 0.15	±0.00 +±0.00 +
α_{-W} we certation γ -subsementation $\alpha_{-Syst}Wtxsec$ $\alpha_{-Syst}Wtxsec$	± 0.09 ± 0.07	五 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	王 0.00 1 1 0.01 1 1 0.01	五 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	王 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.01 11.011.0	五 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	上 00.00 10.00 10.00	10.00 10.00	10.00 10.00 10.00 10.00		00.00 10.00 10.00	上 00.00 二 10.00
a_PileUp CellOut energy resolution a variat Zxsor	± 0.07 ± 0.05 ± 0.04	±0.00 ±0.00 +0.00	±0.03 ±0.00	+0.00 +0.00	±0.00 ±0.00 +0.00	±0.00 ±0.00 +0.00	+0.00 +0.00	土0.00 十二0.00 十0.00	+0.00 +0.00	±0.02 ±0.02	±0.08 ±0.07	±0.00 +0.00
$\frac{\gamma_{-s}hape_{-mcstat_t\bar{t}W} + t\bar{t}Z + t\bar{t}WW_SR_obs_BDTG_bin_0}{\alpha_{-s}stTplusXsec}$	± 0.03 ± 0.03	±0.00	±0.00 ±0.00	±0.00	±0.00 ±0.00	±0.00 ±0.00	±0.00 ±0.00	± 0.03 ± 0.03	±0.00 ±0.00		±0.00	±0.00
Lumi α_{-JVF}	± 0.02 ± 0.02	±0.00 ±0.00	± 0.01 ± 0.00	±0.00 ±0.00	±0.00 ±0.00	±0.00 ±0.00	±0.00 ±0.00		±0.00 ±0.00	± 0.01 ± 0.00	± 0.00 ± 0.02	±0.00 ±0.00
CellOut energy scale γ_shape_mcstat_ <i>H_SR_</i> obs_BDTG_bin_0	± 0.01 ± 0.01	± 0.00 ± 0.00	±0.00 ±0.00	± 0.00 ± 0.01	±0.00 ±0.00	±0.00 ±0.00	±0.00 ±0.00		±0.00	± 0.06 ± 0.00	± 0.04 ± 0.00	± 0.00 ± 0.00
$lpha$ _systtZXsec γ _shape_mcstat_tZ_SR_obs_BDTG_bin_0	±0.00 ±0.00	±0.00 ±0.00	±0.00 ±0.00	±0.00 ±0.00	±0.00 ±0.00	±0.00 ±0.00	±0.00 ±0.00		±0.00	±0.00	±0.00 ±0.00	±0.00 ±0.00
a_systWZXsec	±0.00	±0.00 ±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00		±0.00	±0.00
α _syst W W Asec α _syst ZZ Sec	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00 ±0.00		±0.00		00.01 ±0.00	±0.00
γ -shape-mestat- $WWSR_o$ obs-BDTG-bin-0 \sim shane mestat ZZ SR obs BDTG bin 0	+0.00 +0.00	±0.00 +0.00	+0.00 +0.00	±0.00 +0.00	±0.00 +0.00	±0.00 +0.00	±0.00 +0.00	±0.00 +0.00	±0.00 +0.00	±0.00 +0.00	±0.00 +0.00	±0.00 +0.00
γ -shape-mcstat- $Fakes$ - SR -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	土0.00	土0.00	±0.00	±0.00	±0.00		±0.00	±0.00
γ-snape-mcstat_DY_C_SR_obs_BDTG_bin_0 γ_shape-mcstat_WZ_SR_obs_BDTG_bin_0	±0.00	±0.00	00.00 ₩	±0.00	±0.00	±0.00	±0.00 10.00		±0.00	±0.00	±0.00	±0.00
αZZ Generator	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	10.00 10.00
γ -shape_mestat_W t_C R_obs_BDTG_bin_0 γ -shape_mestat_W Z_C R_obs_BDTG_bin_0	±0.00	±0.00	00.0 1 1 0.00 1	±0.00	00.00 ±0.00	00.00 ±0.00	±0.00 ±0.00		±0.00		00.0 1 1 00.0 1 1 00.0 1 1	00.00 ±0.00
γ -shape-mestat_ DY_CR_{o} obs_ $BDTG_{b}$ in_0 \sim share mestat $t\bar{t}W \pm t\bar{t}Z \pm t\bar{t}WW_VR$ obs $BDTG$ hin 0	±0.00 +0.00	±0.00 +0.00	0.00 +	+0.00	±0.00	±0.00	0.00 ++	±0.00 +0.00	+0.00 +0.00	±0.00	+0.00 ++0.00	±0.00 +0.00
γ -shape-mestat- tt T tt T tt W W T t .	±0.00	±0.00	±0.00 ±0.00	±0.00	土0.00	土0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- $WZ_VR_{ m obs}$ -BDTG_bin_0 \sim shape mostat $_{TZ}$ $_{CR}$ obs RDTG bin 0	±0.00 +0.00	±0.00 +0.00	0.00 +	+0.00	±0.00	±0.00	00.00 + 0.00	±0.00 +0.00	±0.00 +0.00	±0.00 +0.00	00.0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0	00.00 +0.00
γ -shape-mcstat- tZ_VR_{obs} -BDTG_bin_0	十0.00	十0.00	十0.00	±0.00	十0.00	十0.00	±0.00		十0.00		十0.00	十0.00
γ _shape_mcstat_tt_VR_obs_BDTG_bin_0 \sim shape mcstat $ZZ VR$ obs BDTG bin 0	±0.00 +0.00	±0.00 +0.00	00.00 ++0.00	±0.00 +0.00	00.00 +0.00	00.00 +0.00	00.00 + 0.00	+0.00 +0.00	±0.00 +0.00	±0.00 +0.00	00.00 +0.00	+0.00
αWZ Generator	土0.00	土0.00	土0.00	±0.00	土0.00	土0.00	土0.00		土0.00		土0.00	十0.00
γ -shape-mcstat- DY - VR_{-} obs- $BDTG_{-}$ bin- 0 lpha- $FakesSvst$	± 0.00	± 0.00	± 0.00	± 0.00	±0.00 ±0.00	±0.00 ±0.00	± 0.00 ± 0.00	±0.00 ±	±0.00 ±0.00	±0.00	00 ^{.00}	±0.00 ±0.00
γ -shape_mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW$ _ CR _obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	土0.00	土0.00	±0.00		土0.00		±0.00	±0.00
γ -shape_mcstat_H_CR_obs_BDTG_bin_0 \sim shape mcstat Z VR obs BDTG bin 0	±0.00 +0.00	±0.00 +0.00	00.00 + + 0.00	±0.00 +0.00	00.0 +0.00	00.0 +0.00	00.00 +0.00	+0.00 +0.00	±0.00 +0.00	±0.00 +0.00	00.0 +0.00	±0.00 +0.00
γ _shape_mcstat_WW_CR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
γ -shape-mcstat-ZZ-CR-obs-BDTG-bin-0 \sim shape mcstat $WW~VR$ obs BDTG bin 0	±0.00 +0.00	+0.00 +	00.00 + 0.00 + 0.00	+0.00	±0.00 +0.00	±0.00 +0.00	00.00 +	±0.00 +0.00	±0.00 +0.00	+0.00 +0.00	00.0 + +	+0.00 +0.00
γ -shape-mcstat- H_VR_{obs} -BDTG_bin_0	土0.00	土0.00	±0.00	土0.00	土0.00	土0.00	±0.00		土0.00		±0.00 ±0.00	土0.00
γ -shape-mcstat- <i>Fakes-CR</i> -obs-BDTG-bin-0	±0.00	土0.00	土0.00	±0.00	±0.00	±0.00	土0.00		土0.00		土0.00	土0.00
γ -shape-mcstat-Z-CK-obs-BD1G-bin-0 \sim shape mcstat $Wt VR$ obs BDTG bin 0	00.0 +0.00	±0.00 +0.00	00.00 + 00.00	±0.00 +0.00	00.0 +0.00	00.0 +0.00	00.0 +0.00	±0.00	±0.00 +0.00	±0.00 +0.00	00.0 +0.00	00.0 +0.00
\sim shane mostat $Fakes VR$ ohs BDTG hin 0	00 0+	000+	000+		00 0+	00 0+	00 0+	+0.00			00	000+

Table 46: Breakdown of the dominant systematic uncertainties on background estimates in SR_1^{SF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Total background expectation	1											
	2.81	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.10	2.63	0.00
Total background error	± 2.10	土0.00	土0.50	土0.01	± 0.00	±0.00	±0.00	土0.03	土0.00	± 0.26	土1.64	±0.00
	-	-	-	-	-	-	-	-	-	-	-	-
Jet energy scale Jet energy resolution	±1.30 +1_16	00.0 +0	±0.31 +0_11	10.0 ₩ +0.01	0.0 ++	00.0 ++0	00.0 + 00.0 +	±0.01 +0.00	00.0 1 1 1 0 1 1 0 1 0 1 1 0 1 0 1 0 1 0	± 0.03 ± 0.23	±0.99	00.0 ₩ +
$\alpha_{-t\bar{t}}$ GenPlusPS	± 0.60	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	+0.00	± 0.60	±0.00
γ -shape-mcstat_ $t\bar{t}$ _ SR_obs -BDTG_bin_0	± 0.57	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.57	± 0.00
$\alpha_{-t\bar{t}}$ ISRFSR	± 0.50	土0.00	土0.00	土0.00	±0.00	土0.00	土0.00	土0.00	±0.00	土0.00	± 0.50	土0.00
CellOut energy resolution	± 0.40	±0.00	± 0.28	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.02	± 0.11	±0.00
α_systttXsec	± 0.26	±0.00	±0.00	00.00 + +	+ + + 0.00 + +	±0.00	±0.00	± 0.00	±0.00	+0.00	± 0.26	±0.00
α_FlieUp CollOut anomar cools	±0.14	00.0 1 1 1	±0.00	B.0 1 1 1 1 1 1	00.0 ₩	00.0 ∏ +	00.0 1 1 1 0	TO:0十	00.0 ₩ +	10.01 10.01	±0.13	00.0 ∏ +
Centout energy scare	1010 1010		00 0H	0.0H	8 0 H +			00.04+	00.0H	10.07		
\sim shape mostat Z SR obs BDTG hin 0	+0.05	00.0+	00.0+	0000+	00.0+	00.0+	+0.00	00.0++	00.0+	+0.05	00.04	00.0+
\sim shane mostat $t\bar{t}W + t\bar{t}Z + t\bar{t}WW SR$ obs BDTG hin 0	+0.02	+0.00	+0.00	+0.00	00.04	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
	± 0.02	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.02	± 0.00	± 0.00
$lpha$ _svstTplusXsec	± 0.02	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.02	± 0.00	± 0.00	± 0.00	± 0.00
Lumi	± 0.01	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$mu_{-t}t\overline{b}DF$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\alpha_\mathrm{syst}Wt\mathrm{Xsec}$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\alpha_{\text{-syst}} W Z \text{Xsec}$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
α _systWWXsec	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
α -systZZXsec	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ _shape_mcstat_tZ_SR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
α -systtZXsec	土0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	土0.00	±0.00
γ -shape-mcstat-H-SR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00		±0.00	± 0.00	±0.00	±0.00
γ -shape-mcstat- $WWSR_obs_BDTG_bin_0$	±0.00	±0.00	00.00	00.04	±0.00	±0.00	±0.00		00.04	±0.00	±0.00	±0.00
γ -shape-mcstat- $W tS R$ obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ_shape_mcstat_W Z_SK_obs_BD I G_bin_U	±0.00	±0.00	±0.00	#0.00 1	⊞ 0.00	±0.00	±0.00	±0.00	00.0 1 1	± 0.00	±0.00	±0.00
γ-shape-mestat- <i>r akes_5 n</i> _obs_ <i>bU</i> I G_bin_0	00.01 +	00.0 1 1 1 0 0 0 1	00.0 1 1 1 0 0 0 1	00.0	00.0 ₩	00.0 1 1 1 0 0	±0.00		00.0 1 1 1 0 1	00.0	00.0 1 1 1 0 0 0 0 1	00.0 1 1 1 0 0 1
U STRAPE-MUSICAL 7 2 2 PDTC his D												
2Z.Generator	00.0+	000+	0000+	000+	000+	000+	+0.00		00.04	000+	+0.00	000+
\sim shape mostat $Wt \ CB$ obs BDTG hin 0	00.0+	+0.00	+0.00	+0.00	00.0+	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat- $t\bar{t}$ - CR -obs-BDTG-bin-0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat- $WZ_CR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
a_JVF	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- DY - CR -obs-BDTG-bin-0		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
$\gamma_shape_mcstat_t\bar{t}W + t\bar{t}Z + t\bar{t}WW_VR_obs_BDTG_bin_0$		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $WZ_VR_obs_BDTG_bin_0$		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-tt-VR_obs_BDTG_bin_0		± 0.00	±0.00	±0.00	± 0.00	± 0.00	± 0.00		±0.00	± 0.00	±0.00	± 0.00
γ-shape-mcstat_tZ_V R_obs_BD'I'G_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ_shape_mcstat_ZZ_V K_obs_BUIG_bin_U	10.00	00.0 1 1 1 0 0 0 1	00.0 1 1 1 0 0	00.0 ₩ +	0.04 1	00.0∏ +	00.0 1 1 0 0 0 0 1 0 0 0 0 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0		00.04 H	±0.00	10.00	00.0
α_W ZGEILETAUUT 2. shana mastat DV VP ahs RDTC him 0												
7_SHAPE-IIICSIAL_UI_V_AUDS_DUI_G_UIII_U & Fake «Syst		00.04	00.04	0.04	8.04	00.01	00.0H		00.0H	00.01 +		00.04
at $t\bar{t}W \pm t\bar{t}Z \pm t\bar{t}WW$		00.04	00.04	0.0	8.0	0.01	00.0+		8.0	0000+		0000+
\sim shape mostat H CR obs BDTG hin 0		+0.00	+0.00	00.0+	00.0+	0000+	+0.00		+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat_ Z - VR -obs_BDTG_bin_0		+0.00	±0.00	+0.00	±0.00	± 0.00	+0.00	± 0.00	+0.00	± 0.00	±0.00	+0.00
γ -shape-mcstat- WW - CR -obs-BDTG-bin-0		± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	土0.00	± 0.00
αWW Generator	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- tZ - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $ZZ_CR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $WW_VR_obs_BDTG_bin_0$	土0.00	± 0.00	土0.00	±0.00	±0.00	± 0.00	土0.00		±0.00	±0.00	土0.00	土0.00
γ -shape-mcstat-H-VR-obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- $Fakes$ - CR -obs-BDTG-bin-0	± 0.00	土0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	±0.00	± 0.00
γ -shape-mcstat-Z-CR-obs-BDTG-bin-0	土0.00	±0.00	土0.00	±0.00	±0.00	±0.00	土0.00	土0.00	±0.00	±0.00	土0.00	土0.00
γ -shape-mcstat- Wt - VR -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	± 0.00	± 0.00	± 0.00	土0.00	±0.00	± 0.00	±0.00	± 0.00
$\sim chomometer Echoic V D obs BDTC bin 0$												

Table 47: Breakdown of the dominant systematic uncertainties on background estimates in SR_2^{DF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Total background expectation	2.06	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.10	1.88	0.00
Total background error	± 1.53	土0.00	± 0.49	± 0.01	±0.00	± 0.00	土0.00	± 0.03	土0.00	± 0.26	±1.07	土0.00
-	-	-	0	-	-	-	-	-	-	-	-	-
Jet energy scale Tet energy resolution	00.1 ±1.00 +0	00.0 ₩	±0.30 11 0.50	10.0 +	8.0 ₩	00.0 # +	00.0 +	10.01 +0.00	0.0 # +	±0.03	0.20 1 − 20 1 − 20	00.0 +
$\alpha t\bar{t}$ GenPlusPS	+0.43	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.43	+0.00
γ -shape-mcstat- $t\bar{t}$ - SR -obs-BDTG-bin-0	± 0.41	±0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	±0.00	± 0.41	土0.00
CellOut energy resolution	± 0.37	± 0.00	± 0.27	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.02	± 0.07	± 0.00
$\alpha_{-t\bar{t}}$ ISRFSR	± 0.32	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.32	± 0.00
$mu_t \bar{t} D F$	± 0.25	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.25	± 0.00
α -syst tt Xsec	± 0.18	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.18	十0.00
CellOut energy scale	± 0.15	±0.00	± 0.25	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.02	± 0.08	±0.00
a_PileUp	±0.11	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.01	±0.00	± 0.01	± 0.09	±0.00
α_denerator	10.10 10.05	00.01 1	00.0 1 1 1 0 0 1	00.04 1	10.00	00.04 1	00.0H	00.01 +0.000	00.0 1 1 0 0 0 1 0 0	01.01 1	00.0 1 1 1 0 0 1	10.00 1
γ -sumpermission $Z_{2}M_{0}$ obs. DU I G_DULU \sim share mostat $t\bar{t}W \pm t\bar{t}Z \pm t\bar{t}WW$ SR ohs RDTG him 0		00.01	00.04	00.04	00.04		00.04	+0.00	00.04	0000+	00.0+	
2	+0.02	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+00.00	+0.00	+0.02	+0.00	+0.00
α -systTplusXsec	± 0.02	±0.00	±0.00	十0.00	土0.00	十0.00	±0.00	± 0.02	± 0.00	±0.00	±0.00	土0.00
Lumi	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
α -systWtXsec	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
α -syst WZX sec	± 0.00	± 0.00	± 0.00	±0.00	±0.00	± 0.00	±0.00	土0.00	±0.00	± 0.00	± 0.00	±0.00
α_systZZXsec	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ_shape_mcstat_tZ_SK_obs_BUTG_bin_0	00.00 1 1 0 0 0 0 0 1	00.0∏	00.0 1 1 1 0 0 1	00.0 1 1 1 0	00.0 1 + 1	00.01 1	00.0∏ +	±0.00	00.0∏	100.00	00.0 1 1 1 0 0 1	00.01 + 0.00
α_sysur⊿Asec ~ shane mostat 7.7 SR ohs RDTG hin 0	00.04	00.01	00.04	00.04	00.04		00.04	00.01	00.04	00.0+	00.0+	
\sim shape mostat WW SR obs BDTG hin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat- DY - SR -obs- $BDTG$ -bin-0	十0.00	±0.00	±0.00	±0.00	十0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	十0.00
γ -shape_mcstat_ $Fakes_SR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ _shape_mcstat_WZ_SR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-H-SR_obs-BDTG-bin-0	± 0.00	± 0.00	土0.00	土0.00	土 0.00	± 0.00	土0.00	±0.00	±0.00	± 0.00	±0.00	土0.00
γ _shape_mcstat_W t_SK_obs_BD TG_bin_0	±0.00	#0.00	±0.00	#0.00	± 0.00	±0.00	#0.00	±0.00	±0.00	± 0.00	±0.00	#0.00
a-dd Generator 	00.01 1 1 0 0 0 0 0 1	00.0 1 1 1	00.0 1 1 1 0 0 1	00.0 1 1 1 0 0 1	00.0 1 1 0	00.0 1 1 1	00.0∏ +	±0.00	00.0 1 1 0 0 0 1	00.01 ₩	00.0 1 1	10.00 1 ± 0.00
· · · · · · · · · · · · · · · · · · ·	00.0H											
A JVF	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
$\gamma_{\rm -shape-mcstat-}DY_CR_{\rm obs-}BDTG_{\rm bin_0}$	±0.00	± 0.00	+0.00	+0.00	± 0.00	± 0.00	+0.00	±0.00	+0.00	± 0.00	±0.00	±0.00
$\gamma_{\text{-shape-mcstat}} t\bar{t}W + t\bar{t}Z + t\bar{t}WW_{\text{-}}VR_{\text{-}}obs_{\text{-}}BDTG_{\text{-}}bin_{-}0$	±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_ $t\bar{t}$ _ $CR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- WZ - VR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- tZ - CR -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	十0.00
γ -shape-mcstat_ $LZ_VR_obs_BDTG_bin_0$	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ-shape_mcstat_ <i>tt_V K_</i> obs_BDTG_bin_0	10.00 1 1 1 0 0 0 0 0 0 0 1	00.04 1	00.0 1 1 1 0 0 1	00.04 1	0.0 ₩	00.04 1	00.0	±0.00	0.0 1 1	00.01 1	00.0 1 1 0	00.0 1 1 0 0 0 0 1
ツンSIIdpe_IIICState ムーケ れ-005-D L G_DIILO の W/ZCanarator	00.04						00.04			0000+		
\sim shape mostat $DY VR$ obs BDTG hin 0	00.0+	0000+	0000+	000+	000++	+0.00	+0.00	10.00	000+	0000+	0000+	+0.00
α FakesSvst	±0.00	±0.00	±0.00	+00.00 +	+0.00 +	±0.00	±0.00	±0.00	+0.00 +	+0.00	±0.00	±0.00
γ -shape_mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW_{-}CR_{-}obs_{-}BDTG_{-}bin_{-}0$		± 0.00	± 0.00	土0.00	土0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	土0.00
γ -shape-mcstat- HCR obs-BDTG_bin_0		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-Z-VR_obs_BDTG_bin_0		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
W_CR_obs_BDTG.		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
αWW Generator	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_ZZ_CR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	±0.00	±0.00	± 0.00	±0.00	土0.00	±0.00	± 0.00	± 0.00	±0.00
γ -shape-mcstat- $WWVR$ obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ-shape-mcstat_H_V K_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ-shape-mcstat- <i>Fakes_CK</i> -obs_BDTG-bin_U	±0.00	±0.00	±0.00	#0.00 0.0	± 0.00	±0.00	±0.00	±0.00	00.0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	± 0.00	±0.00	±0.00
γ_shape_mcstat_Z_CR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ_shape_mcstat_W t_V K_obs_BD TG_bin_0	±0.00	±0.00	±0.00	00.0 ₩	± 0.00	±0.00	±0.00	±0.00	00.0 <u></u> 1 00.01	± 0.00	±0.00	±0.00
γ _shape_mcstat_ $fakes_V \pi_{obs}BULL_{Din_U}$	±0.00	00.0H	00.0 #	Ŧ			00.0+					

Table 48: Breakdown of the dominant systematic uncertainties on background estimates in SR_2^{DF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Uncertainty of channel	SR_3^{DF}	tZ	Wt	Н	MМ	22	MZ	$t\bar{t}W + t\bar{t}Z + t\bar{t}WW$	DY	N	$t\bar{t}$	Fakes
Total background expectation	1.65	0.00	0.02	0.00	0.00	0.00	0.00	0.04	0.00	0.08	1.51	0.00
Total background error	± 1.28	±0.00	± 0.13	土0.00	± 0.05	土0.00	± 0.01	± 0.02	土0.00	± 0.10	± 1.27	±0.00
$\begin{array}{c} a_{-t}t\overline{f}\mathrm{GenP}\mathrm{PlusPS}\\ between gescale\\ \gamma-shape-mestat_t\overline{f}_SR_obs_BDTG_bin_0\\ \alpha_{-t}f\overline{f}\mathrm{SRFSR}\\ derived for the seolution\\ a_{-systt}\overline{f}\mathrm{Xeec}\\ a_{-systt}\overline{f}\mathrm{Xeec}\\ a_{-systt}\overline{f}\mathrm{Xeec}\\ a_{-systt}\overline{f}\mathrm{Xeec}\\ a_{-systt}\overline{f}\mathrm{Versendr}\\ a_{-s}Generator\\ a_{-s}\mathrm{HeUP}\\ dereator\\ a_{-s}\mathrm{HeUP}\\ dereator\\ a_{-s}\mathrm{HoPe-mestat}_t\overline{f}W+t\overline{f}Z+t\overline{f}WW_SR_obs_BDTG_bin_0\\ \gamma_shape-mestat_tW+tSR_obs_BDTG_bin_0\\ \gamma_shape-mestat_ZSR_obs_BDTG_bin_0\\ \gamma_shape-mestat_W_SR_obs_BDTG_bin_0\\ \gamma_shape-mestat_ZSR_obs_BDTG_bin_0\\ \gamma_shape-mestat_W_SR_obs_BDTG_bin_0\\ \gamma_shape-mestat_W_SR_obs_BDTG_bin_0\\ \gamma_shape-mestat_TW_SR_obs_BDTG_bin_0\\ \gamma_shape-mestat_TSR_obs_BDTG_bin_0\\ \alpha_systTPlusXsec\\ a_{-systT}\mathrm{Xsec}\\ a_{-systT}\mathrm{Xsec}\\ a_{-systWW}\mathrm{XSec}\\ a_{-systWWW}\mathrm{XSec}\\ a_{-systWW}\mathrm{XSec}\\ a_{-systWW}\mathrm{XSec}\\ a_{-systWWW}\mathrm{XSec}\\ a_{-systWW}\mathrm{XSec}\\ a_{-systWWW}\mathrm{XSec}\\ a_{-systWWW}\mathrm{XSec}\\ a_{-systWWW}\mathrm{XSec}\\ a_{-systWWW}\mathrm{XSec}\\ a_{-systWWW}\mathrm{XSec}\\ a_{-systWWW}\mathrm{XSec}\\ a_{-systWWW}\mathrm{XSec}\\ a_{-systWWW}\mathrm{XSec}\\ a_{-systWWW}\mathrm{XSec}\\ a_{-systWWWW}\\ a_{-swstWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW$	$\begin{array}{c} \pm 0.97\\ \pm 0.23\\ \pm 0.36\\ \pm 0.36\\ \pm 0.36\\ \pm 0.19\\ \pm 0.07\\ \pm 0.07\\ \pm 0.07\\ \pm 0.07\\ \pm 0.02\\ \pm 0.02\\ \pm 0.00\\ \pm 0.00\\$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 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\\ 0.00 \\ \pm \\ \pm \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ \pm \\ \pm \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ \pm \\ \pm \\ 0.00 \\ 0.00 \\ 0.00 \\ \pm \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00 \\ 0.00$		$\begin{array}{c} \pm 0.97\\ \pm 0.48\\ \pm 0.36\\ \pm 0.36\\ \pm 0.36\\ \pm 0.01\\ \pm 0.00\\ \pm 0.00\\$	10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 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10.00 10.00 10.00 10
γ -shape-mestat. WW_SR obs. BDTG_bin.0 γ -shape-mestat. WW_SR obs. BDTG_bin.0 γ -shape-mestat. WW_SR obs. BDTG_bin.0 γ -shape-mestat. WZ_SR obs. BDTG_bin.0 γ -shape-mestat. WZ_SR obs. BDTG_bin.0 γ -shape-mestat. WL_SR obs. BDTG_bin.0 γ -shape-mestat. WL_CR obs. BDTG_bin.0 γ -shape-mestat. WL_R obs. BDTG_bin.0 γ -shape-mestat. ZL_R obs. BDTG_bin.0 γ -shape-mestat. ZLR obs.	$\begin{array}{c} \begin{array}{c} & \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ & \\ & $				## 0.0 ## 0.0 1.0 0.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0			$\begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 $				
7_shape_mestat_tv t_v r_obs_DU10_pin_0 7_shape_mestat_Fakes_VR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00 ±0.00	±0.00	±0.00	王U.00 土	±0.00 10.00	王U.UU 王0.00	±0.00	±0.00

Table 49: Breakdown of the dominant systematic uncertainties on background estimates in SR_3^{DF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Uncertainty of channel	$SR_3^{\nu r}$	τZ	2 4 4									
Total background expectation	1.22	0.00	0.02	0.00	0.00	0.00	0.00	0.04	0.00	0.08	1.08	0.00
Total background error	土0.88	土0.00	± 0.13	土0.00	± 0.05	土0.00	± 0.01	± 0.02	±0.00	± 0.10	土0.88	土0.00
or triGenPlusPS	+0.69	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	00.0+	+0.00	+0.00	+0.69	+0.00
Jet energy scale	± 0.39	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.01	± 0.00	± 0.04	± 0.34	± 0.00
γ -shape-mcstat- $t\bar{t}$ - SR -obs-BDTG-bin-0	± 0.33	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.33	± 0.00
$\alpha_{-t\bar{t}ISRFSR}$	± 0.24	±0.00	土0.00	±0.00	±0.00	±0.00	±0.00	十0.00	±0.00	± 0.00	± 0.24	±0.00
mu_ttDF	± 0.15	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	± 0.15	±0.00
$lpha$ _systttXsec	±0.11	±0.00	±0.00	#0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.11	±0.00
Jet energy resolution	+0.10	±0.00	±0.11	±0.00	±0.00	±0.00	±0.00	± 0.01	±0.00	±0.00	± 0.22	±0.00
α_ZGenerator	10.01 10.01	00.0 1 1 1 0 0 0 1	±0.00	00.0H	0.00 H H	10.00 1	00.0 1 1 0 0 0 0 1 0 0 0 0 1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0		00.0	10.0±	10.00 10.01	00.0∏ +
	20.0H			8 9 9 H H				10.0H				
α_W W Generator CallOut anarows resolution	60.0H			8.0 H +	800 H +			00 0+	00.0H	00.01 H - 00		00.0H
\sim share mostat $t\bar{t}W \pm t\bar{t}Z \pm t\bar{t}WW SR$ ohs BDTG him 0		000+	000+	000+	0000+	000+	0000+		000+	000+	00.0+	0000+
\sim shape mostat Z SR obs BDTG hin 0	+0.02	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.02	+0.00	+0.00
γ -shape-mcstat- Wt - SR -obs- $BDTG$ -bin-0	± 0.02	±0.00	± 0.02	±0.00	± 0.00	±0.00	+0.00		±0.00	+0.00	± 0.00	± 0.00
α -svstZXsec	± 0.01	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.01	± 0.00	± 0.00
CellOut energy scale	± 0.01	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.01	± 0.00
α _systTplusXsec	± 0.01	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
Lumi	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
α -syst $WtXsec$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- tZ - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
α -systtZXsec	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00		± 0.00
α -syst WZ Sec	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00		± 0.00
α -syst ZZ sec	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
α -systWWXsec	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $WZ_SR_{obs}BDTG_{bin}0$	±0.00	±0.00	土0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- <i>H</i> - <i>SR</i> -obs- <i>BD</i> /I'G-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- $Fakes_SR_obs_BDTG_bin_0$	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ-shape-mostat-DY_SK-obs_BDTU-Din-U	00.0∏ -	±0.00	±0.00	00.0 ₩	00.0 1 1	±0.00	±0.00		00.0 1 1 0 0	± 0.00		±0.00
7-SHape-IIICStat-Z Z J A_OUS-D L G_DIILO of shano mostat IVIV/ S P obs BDTC him 0												
27. Generator	00.0+	000+	000+	000+	800+	000+	000+		000+	+0.00	000+	000+
\sim shape mostat $Wt \ CR$ obs BDTG bin 0	00.0+	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
γ shape mostat WZ CR obs BDTG bin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
α_JVF	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- DY - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
$\gamma_shape_mcstat_t\bar{t}W + t\bar{t}Z + t\bar{t}WW_VR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $t\bar{t}$ - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $WZ-VR$ -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ $tZ_CR_obs_BDTG_bin_0$	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ_shape_mcstat_tZ_VK_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ_shape_mcstat_tt_V K_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00		±0.00	±0.00
γ -shape-mcstat-ZZ-VR-obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00		±0.00	±0.00
α -WZGenerator	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ-shape-mcstat-DY-VK-obs_BDTG_bin_0	±0.00	±0.00	#0.00	#0.00	#0.00	±0.00	±0.00		±0.00	± 0.00	±0.00	±0.00
α - Fakessyst		±0.00	100 1	0.0 ₩	00.0 1 1	100∏	±0.00		00.0 1 1 1 0 0 0 1	00.0∏	±0.00	±0.00
γ -shape-mcstat_ttW + ttZ + ttW W_CK-obs_BD'IG_bin_0		±0.00	#0.00	#0.00	# 0.00	±0.00	±0.00		±0.00	± 0.00	±0.00	±0.00
γ -shape-mostat- $H_C R_{-}$ obs- $BD'I'G_{-}$ bin- 0		±0.00	±0.00	00.0 ₩	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ-snape-mcstat-Δ-V R-obs-BD 1 G-Din-U		±0.00	100 1	0.0 ₩	00.0 1 1	100∏	±0.00		00.0 1 1 1 0 0 0 1	00.0∏	±0.00	±0.00
· chara mactot 77 / DD cha DDTC him 0				8.0 H H								
0 ""I DUUG of G II /III/I totoom ombor".												
γ_snape_mestat_W W_V N_ODS_DUIG_DUIG_DUIG	00.0H	00.0H	00.0H	00.0H	00.04	00.0H	00.01 1	0000+		00.0H		00.0H
				8.04	8.04				8.04	000+	00.0+	
Tahape_mustater 7 / D she BDTC him 0												
\sim share most at $W + VR$ obs BDTG bin 0		00.0+	00.04	8.04	8.0+	00.0+	00.0+		000	000+	00.0+	00.0+
\sim shape most at Fakes VR obs BDTG hin 0	00.0+	000+	000+	000+	000+	000+	+0.00	1000	00 0+			000+
Janabe-mostar-1, aves A 11-000-1 T dominant			00.01		00.00							

Table 50: Breakdown of the dominant systematic uncertainties on background estimates in SR_3^{DF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

	P.1.4	3	2				1	44 44 00 - 27 00 - 44 00					
Total background expectation	4.35	0.00	0.11	0.00	0.97	0.02	0.01	0.39	0.	0.00 0.	.02	2.84	0.00
Total background error	± 1.38	±0.00	± 0.15	±0.00	± 0.23	± 0.02	± 0.01	土0.11	0#	±0.00 ±(±0.02 =	± 1.27	±0.00
α -ttGenerator	± 0.73	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	0 + -	±0.00 ±(+0.00 +0.00	± 0.73	±0.00
CellUtt energy scale	±0.09	00.01 1	00.0H	B.0 ₩ +	70.0 H H	00.0	00.01 ₩	10.01 10.01	р с Н Н			10.01	00.01 1
Jenapernosaale	+0.49	00.04	0000+	00.0+	0.01	00.0+	00.0+	+0.02	++			F0.37	0000+
α -systt $\overline{t}\overline{t}$ Sec	± 0.28	±0.00	土0.00	+0.00	±0.00	±0.00	±0.00	±0.00	1 ++	_		± 0.28	±0.00
Jet energy resolution	± 0.24	± 0.00	± 0.00	±0.00	土0.00	± 0.00	± 0.00	± 0.02	1			E0.26	土0.00
γ -shape-mcstat- WW - SR -obs-BDTG-bin-0	± 0.18	± 0.00	± 0.00	± 0.00	± 0.18	± 0.00	± 0.00	± 0.00	0	±0.00 ±(土0.00	± 0.00	± 0.00
α_{-} PileUp	± 0.17	± 0.00	± 0.11	± 0.00	± 0.02	± 0.00	± 0.00	± 0.02	0			± 0.07	± 0.00
α -trigger	± 0.13	± 0.00	± 0.00	±0.00	± 0.03	土0.00	± 0.00	± 0.01	0 + -			± 0.09	土0.00
$\alpha_{-ttISRFSR}$	± 0.13	±0.00	±0.00	00.01	±0.00	±0.00	±0.00	±0.00	0 ·			± 0.13	±0.00
	土0.11	±0.00	±0.00	00.01	±0.00	±0.00	±0.00	±0.00	-			± 0.11	±0.00
γ -shape-mcstat- $W t$ - SR -obs- BD TG-bin-0	± 0.11	±0.00	± 0.11	±0.00	±0.00	±0.00	±0.00	±0.00	0 0			±0.00	±0.00
a_systTplusAsec	±0.09	±0.00	±0.00	0.0 ₩	± 0.00	±0.00	±0.00	±0.09	⊖ ¢ # -			±0.00	±0.00
γ -snape-mcstat- <i>itty</i> $\pm itz \pm itW$ W $2R_{00S}$ -DD1 G_DIL-0 ~ 1075	0.00 H H				00-04 H H			60.0H	H H				
CLUVE A stret IV/IV/Vence	10.05 H				00.04			10.00	р с Н				
a WW Cenerator		000+	000+	8.04	10.02	00.0+	00.0+	00.0+	++				00.0+
Limi	+0.04	000+	000+	0000+	+0.03	000+	00.0+	+0.01	++			00 0+	
CellOut energy resolution	± 0.04	± 0.00	± 0.00	± 0.00	± 0.04	± 0.00	± 0.00	± 0.00	1 +			± 0.08	± 0.00
$\alpha_{\rm -syst}Wt { m Xsec}$	± 0.02	± 0.00	± 0.02	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	0#			E0.00	± 0.00
$\alpha_z Z$ Generator	± 0.02	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	0			土0.00	土0.00
γ -shape-mcstat-ZZSR_obs_BDTG_bin_0	± 0.02	± 0.00	土0.00	±0.00	土 0.00	± 0.02	土0.00	土0.00	0 			土0.00	土0.00
$\alpha_z Z Z$ Generator	± 0.01	±0.00	±0.00	±0.00	±0.00	±0.01	±0.00	±0.00	0 (+ -		_	±0.00	±0.00
γ -shape-mcstat-Z-SK-obs-BD'I'G-bin-0	±0.01	±0.00	±0.00	0.0 ₩	± 0.00	±0.00	±0.00	±0.00	⊖ ⊂ # -	00.0	+0.01	±0.00	±0.00
γ_snape_mestat_W Z_Z R_obs_D I G_pin_0	10.01	00.0H		B.0 ₩	8.0 H H	00.0H	10.0H	10.00	р с Н Н			00.01	
a systrZ sec	+0.00	+0.00	+0.00	+0.00	00.00 + 0.00	+0.00	+0.00	+0.00	++			+0.00	+0.00
$\alpha_{\text{-syst}}ZXsec$	土0.00	± 0.00	± 0.00	±0.00	土0.00	± 0.00	± 0.00	± 0.00	1			土0.00	土0.00
γ -shape-mcstat- tZ - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	0+			土0.00	± 0.00
α -systZZXsec	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	± 0.00	0 + -			±0.00	±0.00
α -systWZXsec	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	0 4			±0.00	±0.00
mu_ttDF 2. chang montat U CD cha DDTC him O	00.01 +0	00.0 1 1	00.0∏	0.0 1 1 1	00.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	00.0 1 1 1 0 0 0 1	00.0 1 1 1 0 0 0 1	±0.00	р с Н Н			00.01 +0.00	00.01 +
γ_snape_mestat_ <i>n_5.n</i> _00s_DD_1_G_Dn_0 ~ shape mestat <i>Fakes SR</i> obs BDTG bin 0	00.0H	00.0H	00.0H	8.0 H +	8.0 H +	00.0H	00.0H	00.01 +0.00	рс Н+			00.0H	00.0 H
γ -shape-mestat_ $DY_SR_{obs}BDTG_{bin-0}$	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	1 +		+ 00.00 +	±0.00	±0.00
γ -shape-mcstat- $Wt_CR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	1			±0.00	土0.00
γ -shape-mcstat- $t\overline{t}$ - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	0#			土0.00	± 0.00
γ -shape-mcstat- WZ - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	0		土0.00	土0.00	± 0.00
γ -shape-mcstat- DY - CR -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	0 + -			±0.00	±0.00
γ -shape-mostat_ttW + ttZ + ttW W -V K_ODS_BUTG_DM_U	00.01 ₩	00.0 1 1 1	00.0 1 1 1 0 0	0.0 ₩	00.0 1 1 1	00.0 1 1 1 0 0 1	00.0 1 1 1 0 0 0 1	±0.00	р с Н Н			00.01 ₩	00.01 1
γ shape-mestat $t\bar{t}$ V R-obs BDTG-bin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	++		+ 0.00 +	+0.00	+0.00
γ -shape-mcstat_ $tZ_VR_obs_BDTG_bin_0$	土0.00	±0.00	土0.00	±0.00	土0.00	土0.00	土0.00	±0.00	1 +			土0.00	土0.00
γ -shape-mcstat- $ZZ-VR$ -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	0+			土0.00	± 0.00
γ -shape-mcstat_ $DY_VR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	0			± 0.00	± 0.00
α -FakesSyst	土0.00	± 0.00	± 0.00	±0.00	±0.00	土0.00	± 0.00	±0.00	0 + -			±0.00	土0.00
γ -shape-mcstat_ttW + ttZ + ttWW_CR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	0.4			±0.00	±0.00
γ-shape-mcstat- <i>H-CR</i> -obs-BDTG-bin-0	±0.00	±0.00	±0.00	0.0 ₩	± 0.00	±0.00	±0.00	±0.00	⊖ ¢ # -			±0.00	±0.00
γ -shape-mestat-Z-V K-obs-BUTG-bin-U	00.0 1 1 1 0 0 0 1	00.0 + 0.0 +	00.0∏ +	0.0 1 1 1 0	0.0 ₩ +	00.0	100.01 1	±0.00	о с Н Н			00.00 + ±0.00	±0.00
γ_snape_mestat_W W_CK_ODS_DD1G_DIN_U « shana mestat + Z CR ohs RDTC hin 0	00.01 1	00.0H	00.0H	B.0 ₩	8.0 H H	00.0H	00.0H	10.00	р с Н +				
\sim shape mostat ZZ CR obs BDTC bin 0	000+	00.0+	000+	8.04	000	00.0+	00.0+	00.0+	++			00.0+	00.0+
\sim shape mostat $WW VB$ obs BDTG hin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	1+		00.0+	+0.00	+0.00
γ -shape-mestat- H_VR_{obs} -BDTG_bin_0	±0.00	±0.00	土0.00	±0.00	±0.00	±0.00	±0.00	±0.00	0 +			±0.00	±0.00
γ -shape-mcstat- $Fakes-CR$ -obs-BDTG-bin-0	+0.00	±0.00	土0.00	+0.00	土0.00	±0.00	±0.00	±0.00	1 ++			±0.00	±0.00
γ -shape-mcstat-Z-CR-obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	0+			土0.00	± 0.00
γ -shape-mcstat- $WtVR$ obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	0#	±0.00 ±(±0.00	± 0.00	± 0.00
γ -shape-mcstat- $Fakes$ - VR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	0#			H0.00	+0.00

Table 51: Breakdown of the dominant systematic uncertainties on background estimates in SR_4^{DF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Uncertainty of channel	P110	1										
Total background expectation	4.09	0.00	0.11	0.00	0.97	0.02	0.01	0.39	0.00	0.02	2.59	0.00
Total background error	± 1.07	±0.00	± 0.15	±0.00	± 0.23	± 0.02	± 0.01	土0.11	±0.00	± 0.02	± 0.98	±0.00
a. HTC anotation	aa nit	00 07	0000	00 01	000+	00.01	0001	00 07	00 07		99 UT	00.01
CallOut anarous scale	+0.00 +0.63			8.0	20.04				8.04			00.0+
\sim shane mostat $t\bar{t}$ SR ohs RDTG hin 0	+0.26	000++	00.0+	8.04	000+	000+	000+		0000+	000++	+0.56	00.0+
Jet energy scale	+0.46	+0.00	+0.00	+0.00	+0.10	+0.00	+0.00		+0.00	+0.00	+0.33	+0.00
t = t DF	+0.43	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	00.0+	+0.00	+0.00	+0.43	00.0+
or svsttfTX sec	+0.26	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.26	+0.00
Jet energy resolution	+0.22	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.02	+0.00	+0.00	+0.24	+0.00
\sim shape mostat $WW SR$ obs BDTG hin 0	+0.18	+0.00	+0.00	+0.00	+0.18	+0.00	+0.00	00.01+	+0.00	+0.00	+0.00	+0.00
	+0.17	+0.00	+0.11	00.0+	+0.02	+0.00	+0.00	+0.02	+0.00	+0.00	+0.06	+0.00
art neop a triager	+012	000+	1000+	800+	+0.02	000+	000+	+0.01	000+	000++	80.04	000+
A HISPFSR			000+	800+				10.00 +	000+		110.04	000+
a chone weetet 17/4 CD che DDTA him A												
	11.0 H H			B 0	800 H H				8.0 H H			
								00.04	8.0			
α -systift plus Asec	90.02 H H			8.0 H H	00.04 H H			H0.08	8.0 H H	00.00 H H		
	10.02				H 0.01			E0.01	00-04-	00.01 H		00.0H
					8 0 H H			00.0H				
a w w Generator	60.0H-	00.0H	00.0H	00.0H	60.0 H -	00.0H	00.0H		00-0H-	00.01 H	00.0H	00.0H
	±0.04	±0.00	±0.00	00.0 1 1	₩.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	±0.00	±0.00	±0.00	00.0 1 1	± 0.00	±0.04	±0.00
	H0.04			8.0 H H	8 0 H H			10.01	8.0 H H	00.00 H H	00.04	
CellOut energy resolution	60.0H				#0.0#							
	70.07 								8.0			
a share wester 77 GP ohe BDTC him 0	70.07 									70.04		
7.7.7. Concrator	10.0+	00.0+	00.0+	8.04	800++	10.01	00.0+	00.0+	000+	000++	00.0+	00.0+
~ share mostat Z SR ohe BDTC him 0	10.04				800+			00.04		1004	00 0+	
× share mostat WZ SR ohs RDTC hin 0	10.04		000+	800+			10.04	00.0+	000+		000+	000+
2. W Z Generator	+0.01	+0.00	+0.00	+0.00	+0.00	+0.00	+0.01	+0.00	+0.00	+0.00	+0.00	+0.00
or svsttZXsec	00.0+	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
or svstZXsec	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
\sim share mostat tZ SB obs BDTG hin 0	00.0+	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
$\alpha_{\rm syst}ZZ$ sec	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
$\alpha_{\rm -syst}WZXsec$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- DY - SR -obs- $BDTG$ -bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-H-SR-obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ _shape_mcstat_ $Fakes_SR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $WtCR$ obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $WZ_CR_obs_BDTG_bin_0$	土0.00	土0.00	±0.00	±0.00	±0.00	± 0.00	土0.00	十0.00	土0.00	土0.00	土0.00	土0.00
γ -shape-mcstat- DY - CR_{obs} - $BDTG_{bin-0}$	土0.00	土0.00	±0.00	±0.00	±0.00	±0.00	土0.00	±0.00	土0.00	±0.00	±0.00	土0.00
γ -shape-mcstat- $ttW + ttZ + ttWW - VR$ -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat_tt_CR_obs_BD'I'G_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat-W Z-V R-obs-BD I G-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ_shape_mcstat_tZ_CK_obs_BDTG_bin_0	±0.00	±0.00	±0.00	#0.00	# 0.00	#0.00	±0.00	±0.00	00.0 ₩	± 0.00	±0.00	±0.00
Y_Shape_IIICStat_tZ_V A_ODS_DUIG_DUIG_DUIG 2. chang magtat 47 1/D chg DDTC hin 0					8 0 H H				8.0 H H			
O "HOLD I DECOMPTATION OF A DUTCHING OF A												
γ -shape-micstat- $DV VR$ obs BDTC bin 0 \sim shape mostat $DV VR$ obs BDTC bin 0	00.0H	00.0H		00-04 H +	00.0H	00.04	00.0H	00.04	8.0 H +	00.0H	00.04	00.0H
V Pake Svet		000+	00.0+	8.04	800+	000+	000+	00.0+	000+	000++	00.0+	000+
at $t\bar{t}W + t\bar{t}Z + t\bar{t}WW C$		000+	0000+	000+	000+	000+	+0.00	10.00	000+	000+	+0.00	000+
\sim shape mostat H CR obs BDTG bin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
\sim share mostar Z VR obs BDTG hin 0	00.0+	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
\sim shape-mcstat- WW - CR -obs-BDTG-bin-0	+0.00	± 0.00	± 0.00	+0.00	± 0.00	± 0.00	± 0.00	+0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-ZZ_CR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\gamma_{\rm shape-mcstat-}WW_VR_{\rm obs-}BDTG_{\rm bin_0}$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_ H_VR_{obs} _BDTG_bin_0	+0.00	± 0.00	± 0.00	+0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\gamma_{ m shape=mcstat}Fakes_CR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\gamma_{\rm -shape-mcstat-Z_CR-obs_BDTG_bin_0}$	+0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\gamma_{\rm shape-mcstat}Wt_VR_{\rm obs.BDTG_{\rm bin_0}$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
$\gamma_{-shape_mcstat_Fakes_VR_obs_BDTG_bin_0}$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	+0.00	+0.00	+0.00
-												

Table 52: Breakdown of the dominant systematic uncertainties on background estimates in SR_4^{DF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Uncertainty of channel	SR_5^{DF}	tZ	Wt	Η	MM	ZZ	ZM	$t\bar{t}W+t\bar{t}Z+t\bar{t}WW$	DY	N	$t\bar{t}$	Fakes
Total background expectation	7.54	0.00	0.41	0.00	1.91	0.02	0.23	0.68	0.00	0.01	4.28	0.00
Total background error	± 4.29	±0.00	± 0.39	± 0.01	± 1.46	± 0.02	± 0.25	± 0.17	±0.00	± 0.01	± 3.98	±0.00
$\alpha_{-t\bar{t}}Generator$ $\alpha_{-W}WGenerator$ Jet energy resolution γ shape mcstat. $t\bar{t}_{-S}R_{-}$ obs.BDTG.bin.0 $\alpha_{-PileUt}$	± 3.62 ± 1.43 ± 0.94 ± 0.74 ± 0.73	10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10 10.00 10.00 10.00 10.00 10.00 10 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00	+0.00 +0.00 +0.00 +0.07 +0.00	++0.00 ++0.00 ++0.00 ++0.00	± 0.00 ± 1.43 ± 0.04 ± 0.00 ± 0.00 ± 0.03	++0.00 ++0.00 ++0.00 ++0.01	± 0.00 ± 0.01 ± 0.01 ± 0.03 ± 0.03	±0.00 ±0.00 ±0.03 ±0.01 +0.01	00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00.00 00	++++0.00 +++++0.00 ++++++++++++++++++++	± 3.62 ± 0.00 ± 1.00 ± 0.74 ± 0.71 ± 0.50	0.00 0.00 0.00 0.00 0.00 0.00 0.00
Centour energy resolution Cellout energy scale α -systificsec γ -shape-mestat_ W t_ S R_obs_BDTG_bin_0 γ -shape-mestat_ W W_ S R_obs_BDTG_bin_0 γ -shape-mestat_ W W_ S R_obs_BDTG_bin_0 α -trigger α -trig	± 0.00 ± 0.47 ± 0.43 ± 0.37 ± 0.25 ± 0.23 ± 0.23 ± 0.23 ± 0.23 ± 0.23 ± 0.23 ± 0.23 ± 0.023 ± 0.02		+++0.00 +++0.00 +++0.00 +++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.00 ++0.0	$00000 \pm 000000000000000000000000000000$	± 0.05 ± 0.00 ± 0.00 \pm		+ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$	$\begin{array}{c} \pm 10.02\\ \pm 0.02\\ \pm 0.00\\ \pm 0.00\\ \pm 0.00\\ \pm 0.02\\ \pm 0.02$	$\begin{array}{c} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 $		± 0.030 ± 0.043 ± 0.043 ± 0.030 ± 0.000 ± 0.013 ± 0.017 ± 0.007 ± 0.007	00.00 00.00 00.00 00.00 00.00 00.00 00.00 00
γ -shape-mestat-WZ-SR-obs.BDTG-bin_0 c-systWWXsec Lumi α -systWWXsec γ -shape-mestat. $t\bar{t}W + t\bar{t}Z + t\bar{t}WW$ -SR.obs.BDTG-bin_0 γ -shape-mestat. ZZ -SR-obs.BDTG-bin_0 γ -shape-mestat. ZZ -SR-obs.BDTG-bin_0 γ -shape-mestat. Z -SR-obs.BDTG-bin_0 α -systW Zsec γ -shape-mestat. Z -SR-obs.BDTG-bin_0 α -systW Zsec α -systZsec	± 0.00	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	$\begin{array}{c} \pm 0.00\\ \pm 0.10\\ \pm 0.00\\ \pm 0.00\\$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	±0.00 ±0.02 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$		$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	$\begin{array}{c} \pm \pm 0.00\\ \pm 0.0$
$ \begin{split} & \gamma \text{-shape-mestat.} IZ_SR.\text{obs.} \text{BDTG.bin.0} \\ & \alpha \text{-systZ} \text{Xsec} \\ & \gamma \text{-shape-mestat.} H_SR.\text{obs.} \text{BDTG.bin.0} \\ & \gamma \text{-shape-mestat.} IASR.\text{obs.} \text{BDTG.bin.0} \\ & \gamma \text{-shape-mestat.} DY_SR.\text{obs.} \text{BDTG.bin.0} \\ & \gamma \text{-shape-mestat.} DY_SR.\text{obs.} \text{BDTG.bin.0} \\ & \gamma \text{-shape-mestat.} DY_SR.\text{obs.} \text{BDTG.bin.0} \\ & \gamma \text{-shape-mestat.} DY_CR.\text{obs.} DDTG.\text{bin.0} \\ & \gamma \text{-shape-mestat.} DY_CR.\text{obs.} DDTG.\text{bin.0} \\ \end{pmatrix} \\ & \gamma \text{-shape-mestat.} DY_CR.\text{obs.} DDTG.\text{bin.0} \\ & \gamma \text{-shape-mestat.} DY_CR.\text{obs.} DDTG.\text{bin.0} \\ \end{pmatrix} \\ & \gamma \text{-shape-mestat.} DY_CR.\text{obs.} DDTG.\text{bin.0} \\ \end{pmatrix} \\ & \gamma \text{-shape.} DY_CR.\text{obs.} DDTG.\text{bin.0} \\ \end{pmatrix} \\ & \gamma \text{-shape.}$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	$\begin{array}{c}++++++++++++++++++++,\\++++,0,0,0,0,0,0,0$	$\begin{array}{c} \pm 0.00 \\ \pm 0.0$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.0	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$		$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	± 0.00
$\begin{split} & \gamma\text{-shape-mestat}.ZZ_VR_obs\text{-BDTG-bin.0} \\ & \gamma\text{-shape-mestat}.DY_VR_obs\text{-BDTG-bin.0} \\ & \gamma\text{-shape-mestat}.DY_VR_obs\text{-BDTG-bin.0} \\ & \gamma\text{-shape-mestat}.RU + t\tilde{t}Z + t\tilde{t}WW_CR_obs\text{-BDTG-bin.0} \\ & \gamma\text{-shape-mestat}.RUCR_obs\text{-BDTG-bin.0} \\ & \gamma\text{-shape-mestat}.ZVR_obs\text{-BDTG-bin.0} \\ & \gamma\text{-shape-mestat}.ZCR_obs\text{-BDTG-bin.0} \\ & \gamma\text{-shape-mestat}.ZCR_obs\text{-BDTG-bin.0} \\ & \gamma\text{-shape-mestat}.R_VR_obs\text{-BDTG-bin.0} \\ & \gamma\text{-shape-mestat}.R_VR_obs\text{-BDTG-bin.0} \\ & \gamma\text{-shape-mestat}.R_VR_obs\text{-BDTG-bin.0} \\ & \gamma\text{-shape-mestat}.ZCR_obs\text{-BDTG-bin.0} \\ & \gamma\text{-shape-mestat}.ZCR_obs\text{-BDTG-bin.0} \\ & \gamma\text{-shape-mestat}.ZCR_obs\text{-BDTG-bin.0} \\ & \gamma\text{-shape-mestat}.R_VR_obs\text{-BDTG-bin.0} \\ & \gamma\text{-shape-mestat}.R_VR_Obs\text{-shape}.R_VR_Ob$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	$\begin{array}{c} \pm 0.00\\ 0.00\\ \pm 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0.00\\ 0$	$\begin{array}{c} \pm 0.00 \\ \pm 0.0$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	$\begin{smallmatrix} \pm 0.00\\ \pm 0.00\\ \pm 0.00\\ \pm 0.00\\ 0.00\\ \pm 0.00\\ 0.00\\ \pm 0.00\\ 0.00\\ \pm 0.00\\ $	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$	± 0.00 ± 0.00 ± 0.000 ± 0.0000 ± 0.00000 ± 0.00000 ± 0.00000 ± 0.00000 ± 0.000000 $\pm 0.00000000000000000000000000000000000$	$\begin{array}{c} \pm 0.00\\ \pm 0.00\\$

Table 53: Breakdown of the dominant systematic uncertainties on background estimates in SR_5^{DF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Total background expectation	8.26	0.00	0.41	0.00	1.91	0.02	0.23	0.68	0.00	0.01	5.00	0.00
Total background error	土4.44	±0.00	± 0.39	± 0.01	± 1.45	± 0.02	± 0.25	土0.17	±0.00	± 0.01	± 4.19	±0.00
α_třGenerator α_WWGenerator Jet enerev resolution	± 4.22 ± 1.42 ± 1.10	00.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0	00.00 +0.00	+0.00 + ±0.00	± 0.00 ± 1.42 ± 0.04	00.00 + 00.00 +	+0.00 +0.00	+0.00 +0.00	00.00 1 1 1 0 0 0 0 0 0 0 0 0 0 1 1 1	+0.00 ++0.00	± 4.22 ± 0.00 ± 1.16	00.00 +0.00 +0.00
mu_{t} tDF mu_{t} tDF mu_{t} tDF mu_{t} the BDTG bin 0 \sim share mestat $t\overline{t}$ SR obs BDTG bin 0	±0.87	±0.00 +	00.00 +	+0.00 +	0.00	+0.00 ++	+0.00 +0.00	0.00	±0.00 +			+0.00 +
a_PileUp	土0.84	十0.00	±0.07	十0.00	±0.03	土0.01	±0.03	十0.01	十0.00	±0.00		十0.00
CellOut energy resolution CellOut energy scale	± 0.74 ± 0.54	±0.00 ±0.00	±0.00 ±0.00	±0.00 ±0.00	± 0.12 ± 0.05	±0.00 ±0.00	± 0.03 ± 0.01	$\pm 0.01 \pm 0.02$	00.00 ±0.00	±0.00 ±0.00	± 0.59 ± 0.50	±0.00 ±0.00
	± 0.50	土0.00	±0.00	土0.00	土0.00	土0.00	±0.00	±0.00	土0.00	± 0.00	± 0.50	土0.00
γ _shape_mcstat_Wt_SR_obs_BDTG_bin_0 γ _shape_mcstat_WW_SR_obs_BDTG_bin_0	± 0.37 ± 0.25	±0.00 ±0.00	± 0.37 ± 0.00	±0.00 ±0.00	± 0.00 ± 0.25	±0.00	±0.00 ±0.00	±0.00 ±0.00	±0.00 ±0.00	±0.00		±0.00 ±0.00
a_trigger	± 0.25	±0.00	± 0.01	±0.00	± 0.06	±0.00	± 0.01	± 0.02	十0.00	±0.00		±0.00
α_W ∠Generator α_ttTPartonShower	± 0.22	±0.00	±0.00	00.0 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10	±0.00 ±	±0.00 ±0.00	±0.02	±0.00 ±	00.0 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10	±0.00	±0.00 ±0.20	±0.00
α -systTplusXsec	± 0.15	± 0.00	±0.00	±0.00	± 0.00	± 0.00	±0.00	± 0.15	±0.00			± 0.00
Jet energy scale ~ IVF	± 0.15 ± 0.13	+0.00 +	± 0.02	+0.00 +0.00	± 0.06	±0.00 +0.00	± 0.02	±0.01 +0.00	00.00	+0.00	± 0.08	00.00 +
γ -shape-mcstat- WZ - SR -obs-BDTG-bin-0	±0.10	土0.00	土0.00	10.00	±0.00	±0.00 ±0.00	± 0.10	±0.00	土0.00			土0.00
lpha-syst WW Sec	±0.09	±0.00	±0.00 +0.00	±0.00	± 0.09	±0.00 +0.00	±0.00	±0.00 ±0.02	+0.00 +	+0.00	+0.00 +	±0.00
$\alpha_{ m syst}Wt$ sec	±0.08	±0.00	±0.08	±0.00	00.00 + 0.00	中 10.00 10.00 10.00	±0.00	40.00 10.00	±0.00			±0.00
γ -shape-mcstat- $t\bar{t}W + t\bar{t}Z + t\bar{t}WW$ -SR-obs-BDTG-bin-0	± 0.07	±0.00	±0.00	土0.00	± 0.00	土0.00	±0.00	± 0.07	±0.00			土0.00
lpha-tulshfach $lpha\gamma-shape-mestat_ZZ_SR_obs_BDTG_bin_0$	± 0.03	±0.00	00.00 +0.00	00.0 10.00 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 0.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0	00.00 ₩	± 0.02	00.01 +0.00	±0.00	00.0 +0.00	±0.00 +0.00	±0.03 ±0.00	00.00 +0.00
	± 0.02	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.02	十0.00	± 0.00			± 0.00
γ -shape-mcstat-Z-SR-obs-BDTG-bin-0 \sim ZZG-merator	± 0.01	±0.00 +0.00	00.00 +0.00	0.00 +	+0.00 +0.00	±0.00 +0.01	+0.00 +	±0.00 +0.00	0.00 +0.00	± 0.01	±0.00 +0.00	+0.00 +
$\alpha_z Z Generator$	± 0.01	土0.00	±0.00	±0.00	土0.00	±0.00 ±0.00	±0.00 ±0.00	±0.00	±0.00 ±0.00		土0.00	土0.00
α -systtZX sec	±0.00	±0.00	土0.00	±0.00	±0.00	±0.00	±0.00	十0.00	±0.00			土0.00
γ_sustZZXsec	00.00 +0.00	00.0H	00.01 +0.00	00.01 +0.00	00.0 H +	00.01 +0.00	00.0H	±0.00	00.01 +0.00	100.00 + 0.00	00.01 +0.00	00.01 +0.00
α -systZXsec	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00			± 0.00
y_shape_mcstat_H_SR_obs_BDTG_bin_0	±0.00	±0.00	+0.00 +	±0.00	+0.00 +	±0.00	±0.00	±0.00	±0.00	+0.00	+0.00 +	±0.00
γ -shape-mestat-DY_SR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00 ±			±0.00
γ -shape-mcstat- Wt - CR -obs-BDTG-bin-0	土0.00	土0.00	土0.00	土0.00	土0.00	十0.00	十0.00	±0.00	±0.00			十0.00
γ -shape-mestat- WZ - CR -obs-BDTG-bin-0 \sim share mestat $DV CR$ obs BDTG bin 0	+0.00 +	+0.00 +	00.00 +0	00.00 +	+0.00	±0.00 +0.00	+0.00	+0.00 +0.00	0.00	+0.00	00.00 +	+0.00
γ -shape-mestat- $t\bar{t}W + t\bar{t}Z + t\bar{t}WW$ - VR -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	十0.00	±0.00	±0.00	十0.00	±0.00 ±			十0.00
γ -shape-mcstat_ $t\bar{t}$ _ CR_{obs} _BDTG_bin_0	±0.00	土0.00	土0.00	土0.00	±0.00	土0.00	±0.00	±0.00	土0.00			土0.00
γ_shape_mcstat_W Z_V K_obs_BDTG_bin_0 ~ shane mostat +Z CR obs_BDTG hin_0	+0.00 +	+0.00	00.00 +	00.00 + +	00.00 ++	00.01 +	00.01 +0	+0.00	00.00 ++	±0.00 +	00.0 +0	00.01 +
γ -shape-mcstat- $tZ_VR_obs_BDTG_bin_0$	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00			土0.00
γ -shape-mcstat- $t\bar{t}$ - VR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	土0.00	土0.00	± 0.00	± 0.00	土0.00	± 0.00			± 0.00
γ _shape_mcstat_ZZ_VR_obs_BDTG_bin_0	±0.00	00.00 +	00.00 + 0.00	00.00 + 0.00	+0.00	00.00 +0	00.00 + + 0.00	±0.00	00.00 + 0.00	±0.00	±0.00	±0.00
entroperation - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00			±0.00
γ -shape_mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW_{-}CR_{-}obs_{-}BDTG_{-}bin_{-}0$	± 0.00	± 0.00	± 0.00	土0.00	土0.00	± 0.00	± 0.00	±0.00	± 0.00			± 0.00
γ -shape-mcstat- <i>H</i> - <i>CR</i> -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	土0.00	±0.00			±0.00
γ -shape-mcstat-Z-V K-ODS-BUTG-Din-U \sim shape mcstat $WW \ CR$ obs BDTG hin 0	00.0 +0.00	00.0 +0.00	00.0 +0.00	00.0	00.0 ₩ +	00.0 + 00.0 +	00.01 +0.00	±0.00	00.0 ₩	00.0 + 0.00	00.0 +0.00	00.0 +0.00
γ -shape-mcstat-ZZ_CR_obs_BDTG_bin_0	土0.00	土0.00	土0.00	土0.00	±0.00	土0.00	土0.00	土0.00	土0.00			土0.00
γ _shape_mcstat_WW_VR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00			± 0.00
γ -shape-mcstat- H_VR_{obs} -BDTG-bin-0	±0.00	±0.00	±0.00	十0.00	±0.00	±0.00	十0.00	十0.00	±0.00			十0.00
γ_shape_mcstat_Fakes_CR_obs_BDTG_bin_0 ∞ shane mestat 7 CR obs_BDTG_bin_0	+0.00	00.00 +	00.00 +	#0.00 +	00.00	±0.00	00.00 +	±0.00 +0.00	00.00 +	+0.00	00.00 +	+0.00
γ shape-mestat- $Wt_VR_{obs}BDTG_{bin}$.0	±0.00	±0.00	±0.00	±0.00	+0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00
	± 0.00	± 0.00	+0.00	+0.00	00 0+	+0.00	00 0+	+0.00	+0.00			000

Table 54: Breakdown of the dominant systematic uncertainties on background estimates in SR_5^{DF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

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$\begin{array}{cccccccccccccccccccccccccccccccccccc$					±0.00			00.0H
$R_{\rm obs.BDTG_{\rm bin_0}} = 10.00 \pm 0.00 \pm $				-0.00	+0.00			00.01
0	±0.00			±0.00	±0.00	十0.00		±0.00
	±0.00			± 0.00	± 0.00			
±0.00 ±0.00 ±0.00 ±0.00 ±0.00	= 00.00			± 0.00	± 0.00	±0.00 ±C	±0.00 ±0.00	
1-0 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00	±0.00			± 0.00	± 0.00			± 0.00
$\pm 0.00 \pm 0.00 \pm 0.00 \pm 0.00 \pm 0.00$	±0.00			± 0.00	± 0.00	±0.00 ±C		± 0.00
$\pm 0.00 \pm 0.00 \pm 0.00 \pm 0.00$	±0.00			土0.00	土0.00			± 0.00
$\pm 0.00 \pm 0.00 \pm 0.00 \pm 0.00 \pm 0.00$	±0.00			±0.00	±0.00			±0.00
± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00	+0.00 +			±0.00	±0.00			±0.00
$-bin-0$ $\pm 0.00 \pm 0.00 \pm 0.00 \pm 0.00 \pm 0.00$	= 10.00 1			±0.00	±0.00			±0.00
$\gamma_{\text{Standards}}$ - C.MOBS-DJ1G-DJ1G-DJ1G-DJ1G-DJ1G-DJ2OU TU TU $\gamma_{\text{Standards}}$ - C.MOBS-DJ1G-DJ1G-DJ1G-DJ2OU TU $\gamma_{\text{Standards}}$				00.01 +0.00	±0.00 +0.00		+0.00 ±0.00	00.01 1
$\pm W t_{-} V R_{-} obs_{-} BDTG_{-} bin_{-} 0$ ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00 ± 0.00	00.01 +			-0.00	+0.00			
$-bin_0$ $\pm 0.00 \pm 0.00 \pm 0.00 \pm 0.00 \pm 0.00$	±0.00		±0.00	土0.00	土0.00	±0.00 ±C	±0.00 ±0.00	±0.00

Table 55: Breakdown of the dominant systematic uncertainties on background estimates in SR_6^{DF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Uncertainty of channel	- 9HC	71										
Total background expectation	3.34	0.01	0.41	0.00	1.23	0.02	0.21	0.42	0.00	0.00	1.03	0.00
Total background error	± 1.79	± 0.01	± 0.39	± 0.01	土0.71	± 0.03	± 0.24	± 0.12	±0.00	±0.00	± 1.56	±0.00
α_{-tt} Generator	± 1.51	±0.00	±0.00	±0.00	±0.00		±0.00	+0.00	±0.00	± 0.00	± 1.51	±0.00
αW W Generator	±0.04	±0.00	±0.00	0.0 1 0	±0.04	; ₀ ₩ -	±0.00	±0.00	00.0 	00.0		±0.00
we that the solution \sim share most at $W + SR$ obs BDTC bin 0	+0.47	00.01	+0.37	8.0	71.0H	; c H +	00.04	00.0H	8.04	00.01 +		00.0H
	+0.35	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00	+0.35	+0.00
Jet energy scale	+0.33	+0.00	+0.02	+0.00	+0.14	+0.00	+0.00	+0.03	+0.00	+0.00	+0.14	+0.00
$mu_{-t\bar{t}DF}$	± 0.28	±0.00	±0.00	十0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.28	±0.00
α -PileUp	± 0.24	± 0.00	± 0.07	± 0.00	± 0.02	± 0.01	± 0.05	± 0.02	± 0.00	± 0.00	± 0.23	± 0.00
CellOut energy resolution	± 0.22	± 0.00	± 0.00	± 0.00	± 0.09	± 0.00	± 0.00	± 0.01	± 0.00	± 0.00	± 0.32	± 0.00
αWZ Generator	± 0.21	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.21	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
CellOut energy scale	± 0.20	± 0.00	± 0.00	± 0.00	± 0.01	± 0.00	± 0.00	± 0.01	± 0.00	± 0.00	± 0.18	± 0.00
γ -shape-mcstat- WW - SR -obs-BDTG-bin-0	± 0.20	土0.00	土0.00	土0.00	± 0.20	± 0.00	土0.00	±0.00	±0.00	± 0.00	土0.00	土0.00
$\alpha_{-ttISRFSR}$	± 0.14	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.14	±0.00
α -syst tt Xsec	± 0.10	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.10	±0.00
a_trigger	± 0.10	±0.00	±0.01	±0.00	± 0.04	±0.00	±0.01	±0.01	±0.00	±0.00	± 0.03	±0.00
γ_shape_mcstat_W Z_SK_obs_BD'IG_bin_0	±0.10	±0.00	±0.00	00.0 ₩	±0.00	±0.00	±0.10	±0.00	±0.00	±0.00	±0.00	±0.00
α_syst I plusAsec	±0.09	00.0H	00.0∏	00.0 ∏	00.01 H -	nn.n∏	00.0∏	±0.09	00.0H	00.0H	00.0∏	n
a_systw tAsec	90.0H		80.0H		00.0H		00.0H	00.0H	8.0 H H			
or systWW Xsec	+0.06	00.0+	10.01	0000	90-0+	00.01	+0.00	10.01 +0.01	0000	+0.00	00.01	00.01
γ -shape-mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW$ _SR_obs_BDTG_bin_0	± 0.06	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.06	±0.00	±0.00	±0.00	±0.00
$\alpha_{-t\bar{t}}$ PartonShower	± 0.04	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.04	± 0.00
$\alpha_{-}JVF$	± 0.03	± 0.00	± 0.02	± 0.01	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-ZZ-SR-obs-BDTG-bin-0	± 0.02	± 0.00	土0.00	±0.00	±0.00	± 0.02	土0.00	十0.00	±0.00	± 0.00	土0.00	±0.00
$\alpha_Z Z Generator$	± 0.02	±0.00	±0.00	±0.00	±0.00	± 0.02	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
a_systW Z Asec	±0.01	00.0 10.00 10.00	00.01 +0.00	0.0 1 1 1	0.0 ++	00.0# +0.00	10.01 +0.01	±0.00 +0.00	0.0 1 1 1	00.0 +	±0.00	00.0 + +
\sim shape mostat $tZ SR$ obs BDTC bin 0	10.01	10.01	0000+	000+	000+	00.0+	000+	00.0+	000+	000+	000 +0	+0.00
α -svstZZXsec	十0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	十0.00	±0.00	±0.00	±0.00	±0.00
α -systZXsec	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-Z-SR-obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ _shape_mcstat_ $Fakes_SR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- DY - SR -obs- $BDTG$ -bin- 0	土0.00	土0.00	土0.00	土0.00	±0.00	土0.00	土0.00	±0.00	十0.00	土0.00	土0.00	土0.00
γ -shape-mcstat- <i>H</i> - <i>SR</i> -obs-BDTG-bin-0	±0.00	±0.00	土0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mestat- $W t_C R_{-}$ obs_BDTG-bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ_snape_mcstat_W Z_CK_ODS_BUIG_DIN_U	00.0 1 1	00.0 ∏ +	00.01 1	B.0 ₩	B 0 1 + +	00.0	00.0	00.0H	00.0 ₩	00.0	00.0 1 1 1 0 0 0 0 1	00.0 1 1
γ shape mostat $t\bar{t}W + t\bar{t}Z + t\bar{t}WW V R$ obs BDTG bin 0	00.0+	000+	00.04	8.04	8.0++	00.0+	000+	00.0+	8.0	0000+	00.04	00.0+
γ -shape-mestat- $t\bar{t}$ - CR -obs-BDTG-bin-0	± 0.00	+0.00	+0.00	± 0.00	+0.00	± 0.00	± 0.00	+0.00	± 0.00	± 0.00	+0.00	+0.00
γ -shape-mcstat- $WZ-VR$ -obs-BDTG-bin-0	±0.00	+0.00	土0.00	±0.00	±0.00	+0.00	±0.00	±0.00	+0.00	+0.00	±0.00	±0.00
γ _shape_mcstat_tZ_CR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ _shape_mcstat_tZ_VR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $t\bar{t}$ - VR_{-} obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	十0.00	十0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- $ZZ-VR$ -obs-BDTG-bin-0	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- DY - VR -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	+0.00	±0.00	±0.00	±0.00	±0.00
artiakesSyst	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -snape-mcstat_ttW + ttZ + ttW W -CK_obs_BDTG_pin_0	00.0∏	00.01 +000	00.01 ₩	0.0 1 1 1	0.0 1 + +	00.0 1 1 1 0	00.0∏ +	±0.00	00.0 1 1 0	00.0	00.0 1 1 1 0	00.0∏
γ shape mostat Z VR obs BDTG bin 0	00.0+	00.0+	00.0+	000+	0.01	00.0+	000+	00.0+	000+	+0.00	0000+	0000+
\sim shane mostat $WW CB$ obs BDTG hin 0	+0.00	+0.00	+0.00	0000+	00.00+	+0.00	+0.00	00.01+	0000+	+0.00	+0.00	+0.00
γ -shape-mcstat-ZZ-CR_obs_BDTG_bin_0	± 0.00	土0.00	土0.00	土0.00	±0.00	±0.00	±0.00	10.00	±0.00	± 0.00		土0.00
γ _shape_mcstat_WW_VR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00		± 0.00
γ -shape-mcstat- H_VR_{obs} -BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00
γ -shape-mcstat- $Fakes$ - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-Z-CR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
	十0.00	±0.00	十0.00	±0.00	±0.00	十0.00	土0.00	十0.00	±0.00	±0.00	±0.00	±0.00
	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ _shape_mcstat_ $Fakes_V R_obs_BDTG_bin_0$	±0.00	±0.00	±0.00		+0.00		00.00+	000+				

Table 56: Breakdown of the dominant systematic uncertainties on background estimates in SR_6^{DF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Uncertainty of channel	SK_1	3										
Total background expectation	9.92	0.00	0.00	0.00	0.08	0.00	0.01	0.19	0.00	0.77	8.87	0.00
Total background error	± 3.94	土0.00	± 0.00	±0.00	±0.09	± 0.01	± 0.09	±0.07	±0.00	±0.90	土3.70	±0.00
or t <u>f</u> GenPlusPS	+2,83	00.0+	00.0+	00.04	00.0+	00.0+	00.0+	00 0+	00.0+	00.0+	+2.83	00.0+
Jet energy scale	± 2.04	±0.00	±0.00	±0.00	± 0.02	±0.00	±0.00	± 0.03	±0.00	± 0.26	± 1.73	土0.00
γ -shape_mcstat_ $t\bar{t}$ _ $SR_obs_BDTG_bin_0$	± 1.04	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 1.04	± 0.00
α -syst $t\bar{t}\bar{t}$ Sec	± 0.89	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.89	± 0.00
$\alpha_{-t}\overline{t}$ ISRFSR	± 0.83	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.83	± 0.00
$\alpha_{-}Z$ Generator	± 0.77	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.77	± 0.00	± 0.00
Jet energy resolution	± 0.33	±0.00	土0.00	±0.00	± 0.05	±0.00	±0.00	± 0.02	土0.00	± 0.09	± 0.22	土0.00
γ -shape-mcstat-Z-SR-obs-BDTG-bin-0	± 0.24	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.24	±0.00	±0.00
	± 0.14	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.02	± 0.12	±0.00
CellUut energy scale	±0.14	00.0 1 1	± 0.00	±0.00	±0.00	00.0 ₩	± 0.00	10.01	±0.00	00.0 1 - 0	±0.15	00.0 1 0
a-systzAsec	11.0 11.0 1	8.0 H H									0.0 H H	
α MZGenerator	01.04	00.0+	0000+	0000+	70.01	00.04	00.04	00.0+	00.0+	+0.01	#0.0 +	00.0+
\sim -shape-mestat- WW - SR -obs-BDTG-bin-0	+0.06	+0.00	+0.00	+0.00	+0.06	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
$\alpha W W$ Generator	± 0.04	± 0.00	± 0.00	+0.00	± 0.04	±0.00	+0.00	±0.00	±0.00	± 0.00	±0.00	±0.00
α -systTplusXsec	± 0.04	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.04	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WWSR_obs_BDTG_bin_0$		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.04	± 0.00	± 0.00	± 0.00	± 0.00
Lumi	± 0.03	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.01	± 0.00	± 0.02	± 0.00	± 0.00
γ -shape-mcstat- WZ - SR -obs-BDTG-bin-0	± 0.01	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.01	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
CellOut energy resolution	± 0.01	± 0.00	± 0.00	土0.00	土0.00	土0.00	± 0.00	± 0.01	土0.00	± 0.28	± 0.30	±0.00
$\alpha_z Z Z$ Generator	± 0.01	±0.00	±0.00	±0.00	±0.00	± 0.01	±0.00	十0.00	±0.00	±0.00	±0.00	±0.00
	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat-H-SK-obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
a_systWZAsec	±0.00	00.0 ₩	± 0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	#0.00	#0.00	#0.00 00.0
mu_ttSF 2. chone meetet +7 CD che BDTC him 0	00.01 1 1 1	0.0 ₩	00.0 1 1 1	00.0∏	00.01 1	0.0 ₩	00.0 ₩	00.0H	00.04 1	00.0 1 1 1 0 0	00.0 ₩ ₩	00.0 ₩ +
A subtraction of the outpendict of the outpendict A subtraction of the outpendict of the o	00.0+	8.04	0000+				000+	00.0+		000+	8.0	8.04
v svst W t X sec	000+	0000+	0000+	+0.00	+0.00	0000+	+0.00	10.00	+0.00	000+	000+	00.01+
$\alpha_{\rm syst}ZZ$ Xsec	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- DY - SR -obs- $BDTG$ -bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- Wt - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $Fakes$ - SR -obs- $BDTG$ -bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	土0.00
γ -shape-mcstat-ZZ-SR-obs-BDTG-bin-0		±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat_ttW + ttZ + ttW W_CK_obs_BD'I'G_bin_0		±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat-ZZ-CK-obs-BDTG-bin-0	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mostat- $DY -VR_{ODS}$ -BDTG-bin-0	±0.00	n	± 0.00	±0.00	±0.00	00.0∏	± 0.00	±0.00	±0.00	±0.00	00.0 1 1	00.0 1 1 0 0
γ -snape-incstat-W W - $CR_{-}008$ -DD I G-DIII-U 2 choic moster $4\overline{1}W + 4\overline{7}R + 4\overline{1}WW VD$ cho DDTC his D		8.0 H H									8.0 H H	
γ share most at Z CR obs BDTC bin 0		8.0							00.0+		8.0	8.04
γ shape mostat H CR obs BDTG bin 0		+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
\sim shape mostat $Wt CR$ obs BDTG bin 0		+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat_ZZ_VR_obs_BDTG_bin_0		± 0.00	± 0.00	+0.00	±0.00	±0.00	+0.00	±0.00	±0.00	± 0.00	±0.00	±0.00
γ -shape-mcstat-Z-VR_obs_BDTG_bin_0	+0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
or FakesSvst	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat- tZ_VR_{obs} -BDTG_bin-0	+0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- Wt - VR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	±0.00
$\gamma_{-shape-mcstat-Fakes-VR_obs-BDTG_bin_0}$	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	±0.00	土0.00	± 0.00	土0.00	土0.00
γ -shape-mcstat- $WZ_CR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- tZ - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $t\bar{t}$ - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $H_VR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $Fakes$ - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $t\bar{t}$ - VR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- WW - VR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ DY - CR -obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
\sim shane mostat W Z V R ohe RDTC hin 0				000			- C C C		000	000	00	000

Table 57: Breakdown of the dominant systematic uncertainties on background estimates in SR_1^{SF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Total background expectation	7.25	0.00	0.00	0.00	0.08	0.00	0.01	0.19	0.00	0.77	6.20	0.00
Total background error	± 2.49	土0.00	土0.00	土0.00	土0.09	± 0.01	± 0.09	±0.07	土0.00	土0.90	± 2.25	土0.00
م. ۱۰۰۲ م. ۵۰ م	±1.07	00 07			00.01	0000		00.04	00.04	00.04	±1.07	00 07
Let energy scale	1+	800+			0.01					+0.26	+ + 1 - 2	800++
mul HTSF		000+	000+	000+		000+	000+		00.0+		10.83	000+
or Z.Generator	+0.76	000+	+0.00	000+	000+	000+	000+		00.0+	+0.76	000+	000+
\sim shape mostat $t\bar{t}$ SR obs BDTC hin 0	+0.73	000+	+0.00	000+	+0.00	000+	+0.00		000+	+0.00	+0.73	000+
n svsttf Xsec	+0.61	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.61	+0.00
α $t\bar{t}$ ISRFSR	+0.53	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.53	+0.00
Jet energy resolution	+0.26	+0.00	+0.00	+0.00	+0.05	+0.00	+0.00		+0.00	+0.09	+0.15	+0.00
\sim -shape-mcstat-Z-SR-obs-BDTG-bin-0	+0.24	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.24	+0.00	+0.00
or svst/ZX sec	+0.11	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.11	+0.00	+0.00
or IVF	110+	0000+	+0.00	+0.00	+0.00	00.0+	+0.00		+0.00	+0.02	00.04	000+
CallOut energy scale	1000+	000+	0000+	000+	+0.00	000+	000+		000+	10.01+	+0.00	800
outour outefy source					00.0+		10.00			000+		
α-W 2 Generation												
	80.0T									# 0.0 -		
CeliOut energy resolution	90.0H	0.04 H -	00.0 H -	00.0H	00.0H	00.0H	00.0 H		00.0H-	77.0H	17.0H	00.0H
γ -snape-mcstat-W W -mcstat-M -mcs	00.0H	00.0 1 1	00.0 1 -	00.0∏	00.0H	00.0∏	00.0∏	±0.00	00.0H	00.0∏	00.0∏	00.0H
ary V Generator	HU.U4	0.0 H -	00.0 H -	00.0H	HU.U4	00.0H	00.0 H -		00.0H	00.0H-	00.0 H -	00.0H
	±0.04	0	00.0∏	00.0∏	00.0∏	00.0∏ -	± 0.00		10.00 1	10.00 1	00.0 ∏	00.0 <u></u> 1 −
γ -snape-mcstat_ttw + $tt = ttw w$ - hc -nostat_ttw + ttw	HU.U4	00.0 H -	00.0∏	00.0∏	00.0∐	00.0∏	± 0.00		00.0H	00.0∏	00.0 ∏	00.0∏
ייוששכת ו משמוד ייי ווווחק	60.0H	0.0 H -	00.0 H -	00.0H	00.0H-	00.0H-	0.0 H -		00.0H-	70.07	00.0 H -	00.0H
γ_shape_mcstat_W Z_5K_obs_BUTG_bin_0	±0.01	00.0∄	± 0.00	±0.00	±0.00	±0.00	±0.01		±0.00	±0.00	± 0.00	±0.00
a_Z Z Generator	±0.01	00 ₩	± 0.00	±0.00	±0.00	T0.0±	± 0.00		±0.00	±0.00	00.0 1 1	00.0 <u>∓</u>
	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	± 0.00		±0.00	±0.00	± 0.00	±0.00
γ -shape-mcstat- <i>H</i> - <i>SH</i> -obs- <i>BD</i> 'I'G-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	#0.00
a-syst W ZA sec	±0.00	00.0 ₩	±0.00	±0.00	±0.00	±0.00	± 0.00		±0.00	±0.00	±0.00	±0.00
γ_snape_mcstat_tz_5K_obs_BUTU	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	± 0.00	±0.00
α -systtZXsec	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
α -syst W tXsec	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00		± 0.00	± 0.00	± 0.00	±0.00
α -systZZXsec	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-ZZ-SR-obs-BDTG-bin-0	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- Wt - SR -obs-BDTG-bin-0	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- DY - SR -obs- $BDTG$ -bin-0	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $Fakes$ - SR -obs- $BDTG$ -bin-0	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-ZZ-VR-obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WWCR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ZZ_CR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ_{-} shape_mcstat_ DY_VR_{-} obs_ $BDTG_{-}$ bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- WW - CR -obs-BDTG-bin-0		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WWVR_obs_BDTG_bin_0$		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-Z-CR_obs_BDTG_bin_0	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- <i>H</i> - <i>CR</i> -obs-BDTG-bin-0		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- Wt - CR -obs-BDTG-bin-0		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $t\bar{t}$ - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\gamma_{\rm shape-mcstat-Z-VR-obs-BDTG-bin-0}$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
α -FakesSyst	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
$\gamma_{ m shape_mcstat_tZ_VR_obs_BDTG_bin_0}$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
\sim shape mostat $Wt VB$ obs BDTG bin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
γ shape mostat Fakes VR obs BDTG hin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
\sim shape mostat $WZ \ CB$ obs BDTG bin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
$\gamma_{\rm shape-mcstat-}tZ_CR_{\rm obs-}BDTG_{\rm bin-}0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
\sim shape mostat H V R obs BDTG hin 0	00.0+	00 0+	+0.00	00 0+	00.0+	00.0+	+0.00		00.0+	00.0+	00.0+	+0.00
\sim shape mostat Fakes CB obs BDTG hin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
\sim share mostat $t\bar{t}$ V R obs RDTG him 0	000+	000+	000+	000+	000+	000+	000+		00.0+	000+	0.00+	000+
~ chare moster W/W/ V/R obs BDTC bin 0												
·/-suapermostat. IV / R obs RDTC bin 0	00.0+										8.0	8.04
												5.5
γ _shape_files (at $-W \ge V - M_{ODS} \ge D - T \subseteq D = 0$						1 1 1 1 1 1						

Table 58: Breakdown of the dominant systematic uncertainties on background estimates in SR_1^{SF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Oncertainty of channel	2~	3										
Total background expectation	8.34	0.00	0.10	0.00	0.07	0.00	0.01	0.23	0.00	0.72	7.20	0.00
Total background error	土2.40	±0.00	± 0.33	± 0.00	土0.11	土0.00	± 0.14	±0.08	± 0.00	土0.77	± 2.08	土0.00
Jet energy scale γ-shape_mcstat_tt_SR_obs_BDTG_bin_0	$\pm 1.43 \pm 0.97$	±0.00 ±0.00	±0.14 ±0.00	±0.00 ±	±0.02 ±0.00	年 10.00 10.00	±0.00	土0.03 土0.00	±0.00 ±0.00	±0.01 ±0.00	$\pm 1.24 \pm 0.97$	十0.00 10.00
α -syst tt Xsec α -t ISRFSR	± 0.72 ± 0.72	±0.00 ±0.00	± 0.00 ± 0.00	±0.00	±0.00 ±0.00	±0.00 ±0.00	±0.00	±0.00 ±0.00	±0.00 ±0.00	±0.00	± 0.72 ± 0.72	±0.00 ±0.00
$\alpha_z Z$ Generator	± 0.72	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	± 0.72	±0.00	±0.00
CellOut energy resolution CellOut energy scale	±0.09 +0.54	0.0 # +	±0.19	00.0 +	20.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	00.00 # #	00.0 + +	±0.00 +0.00	00.0#+	±0.02 +0.00	±0.53 10.53	0.0 #+
Jet energy resolution	土0.48	±0.00	± 0.19	±0.00	土0.01	十0.00	±0.00	± 0.02	十0.00	±0.03	土 0.34	十0.00
$\alpha_{-t\bar{t}}GenPlusPS$	± 0.26	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.26	± 0.00
γ -shape-mcstat-Z-SR-obs-BDTG-bin-0	± 0.25	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	十0.00	±0.00	± 0.25	±0.00	±0.00
α_PileUp α W ZGenerator	± 0.14 ± 0.14	00.0 # +	±0.08	00.0 +0.00	±0.01	00.0 ₩	±0.00 +0.14	±0.00	00.0 +0.00	±0.03 +0.00	×10.0+	00.0 +0.00
α_JVF	± 0.14	土0.00	土0.00	十0.00	土0.00	十0.00	十0.00		十0.00	± 0.02	± 0.12	±0.00 ±0.00
α -systZXsec	± 0.11	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.11	± 0.00	± 0.00
γ -shape-mcstat- Wt - SR -obs-BDTG-bin-0	±0.08	±0.00	± 0.08	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ-suapelinestat <i>www.cons</i> DD1G_D110_0 φ systThlusXsec	±0.05	00.0H	00.00 H	00.01 +0.00	00.01 +0.00	00.0H	00.00 +		00.01 +0.00	00.01 +0.00	00.0 H +	00.0H
α -WWGenerator	± 0.05	±0.00 ±0.00	土0.00	土0.00	± 0.05	±0.00 ±0.00	土0.00		土0.00	土0.00	±0.00 ±	±0.00 ±0.00
γ _shape_mcstat_t $\bar{t}W + t\bar{t}Z + t\bar{t}WW_SR_obs_BDTG_bin_0$	± 0.04	土0.00	±0.00	土0.00	±0.00	±0.00	土0.00		±0.00	土0.00	±0.00	±0.00
Lumi A sust W/+Y see	±0.03	0.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	10.00 + 0.00	00.04 +	00.0 1 1 1 1 0 0 0 1 1 0 0 0 1 0 0 1 0 0 1 0 0 1 0 0 0 1 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	00.04 +	00.01 +	±0.01	00.0# +	±0.02	0.0 + +	0.0 ₩
$\gamma_{\text{-shape-mcstat-}}^{\text{-model}} WZ_SR_{\text{-obs-}}^{\text{-bin-0}} BDTG_{\text{-bin-0}}^{\text{-bin-0}}$	± 0.01	±0.00	十0.00	±0.00	±0.00	00.0 1 00.0 1 1 0 0 0 0 1 0 0 0 1 0 0 0 0 0 0 0 1 0 0 0 0 0 1 0 1 0 1 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	± 0.01	±0.00	±0.00	±0.00	±0.00	±0.00
α -syst W W Xsec	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
α -systtZXsec	± 0.00	土0.00	± 0.00	土0.00	土0.00	±0.00	± 0.00		± 0.00	土0.00	±0.00	±0.00
α -syst W Z X sec $\dots $ 47 c π	±0.00	0.00 1 1 0 0 0 0 0 0 0	±0.00	00.00 +	00.00 +0.00	0.00 1 + 1	+0.00	±0.00	±0.00	00.00 +	0.00 ++	0.00 ++
or syst ZZ Xsec	+0.00	00.04	+0.00	+0.00	+0.00	0.01+	+0.00		+0.00	+0.00	00.00 +	00.01
γ -shape-mcstat- tZ - SR -obs-BDTG-bin-0	± 0.00	±0.00	± 0.00	± 0.00	土0.00	±0.00	± 0.00		± 0.00	± 0.00	±0.00	±0.00
γ -shape-mcstat- DY - SR -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- H - SK -obs- BD TG-bin-U \sim shape mcstat $Fakes$ SR obs $BDTG$ hin 0	00.0±	0.0 +	00.0 +	00.0 +0	00.0 1 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	00.04 +0	00.0 +	±0.00 +0.00	00.0# +0.00	00.0 +0	00.0 # #	00.0 # #
γ -shape-mestat- ZZ - SR -obs- $BDTG$ -bin-0	±0.00	十0.00	十0.00	十0.00	±0.00	±0.00	十0.00		十0.00	十0.00	十0.00 10.00	±0.00
$\gamma_shape_mcstat_t\bar{t}W + t\bar{t}Z + t\bar{t}WW_CR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ZZ_CR_obs_BDTG_bin_0	±0.00	00.00 ++	±0.00	±0.00	±0.00	0.00 + +	±0.00	±0.00 +0.00	±0.00	±0.00	0.00 ++	0.00 + +
α_{-L} denerator \sim share mostat $DV VR$ ohs RDTG hin 0	00.0H		0000+	00.0H	00.0H	8.0 H +	0000+		00.0H	00.0H	8.0 H +	8.0 H +
γ -shape-mcstat- $WW_CR_{obs}BDTG_{bin}$ 0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WWVR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-Z-CR_obs_BDTG-bin_0	± 0.00	十0.00	土0.00	十0.00	土0.00	±0.00	土0.00		土0.00	十0.00	±0.00	±0.00
γ -shape_mcstat_H_CR_obs_BDTG_bin_0	±0.00	00.00 ++	±0.00	±0.00	±0.00	0.00 ++	±0.00	±0.00	±0.00	±0.00	00.00 + +	00.00 ++
γ shape mostat ZZ VR obs BDTG bin 0	+0.00	00.04	+0.00	+0.00	+0.00	0.01+	+0.00		+0.00	+0.00	00.00 +	00.00+
γ -shape-mcstat-Z-VR-obs-BDTG-bin-0	±0.00	十0.00	十0.00	±0.00	±0.00	±0.00	十0.00		±0.00	±0.00	±0.00	±0.00
	±0.00	土0.00	土0.00	±0.00	±0.00	±0.00	±0.00		+0.00	±0.00	+0.00	±0.00
γ -shape_mcstat_ $tZ_VR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $Wt_VR_{obs}BDTG_{bin_0}$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ_shape_mcstat_Fakes_VR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00		±0.00	±0.00	±0.00	±0.00
γ-shape_mcstat_W Z_CK_obs_BDTG_bin_0	00.0±	8.0 1 1 1	00.0 1 1 1 0	00.0 1 1 1 0 0 0 1 0 0 0 1	00.01 ₩	0.04 1	00.01 ₩	±0.00	00.0 <u>+</u>	00.0 1 1 1 0 0 0 1 0 0 0 1	0.0 ₩ +	0.0 ₩
γ shape mostat $t\bar{t}$ <i>CR</i> obs BDTG bin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat- $H_VR_obs_BDTG_bin_0$	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $Fakes$ - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $t\bar{t}$ - VR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $WW_VR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- DY - CR -obs- $BDTG$ -bin-0	± 0.00	土0.00	± 0.00	土0.00	土0.00	土0.00	± 0.00	土0.00	± 0.00	土0.00	± 0.00	± 0.00
\sim shane mostat $W \gtrsim V B$ obs BDTG bin 0	00.0+	00.00+										

Table 59: Breakdown of the dominant systematic uncertainties on background estimates in SR_2^{SF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Uncertainty of channel	2112	1										
Total background expectation	6.16	0.00	0.10	0.00	0.07	0.00	0.01	0.23	0.00	0.72	5.03	0.00
Total background error	± 1.48	土0.00	土0.33	土0.00	土0.11	土0.00	土0.14	土0.08	±0.00	土0.76	± 1.10	土0.00
let enerov scale	+1.05	00.0+	+0.14	00.0+	+0.02	00.0+	00.0+	+0.03	00.0+	+0.01	98.0+	00.0+
$\alpha_z Z$ Generator	土0.71	十0.00	十0.00	土0.00	±0.00	±0.00	十0.00	±0.00	土0.00	土0.71	±0.00	十0.00
γ -shape-mcstat_tt¯_SR_obs_BDTG_bin_0	± 0.68	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.68	± 0.00
$mu_t\bar{t}SF$	± 0.67	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.67	± 0.00
CellOut energy resolution	± 0.52	± 0.00	± 0.19	± 0.00	± 0.07	± 0.00	± 0.00	± 0.00	± 0.00	± 0.02	± 0.38	± 0.00
α -syst $t\bar{t}Xsec$	± 0.50	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.50	± 0.00
$\alpha_{-t\bar{t}}$ ISRFSR	± 0.44	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.44	± 0.00
Jet energy resolution	± 0.38	± 0.00	± 0.19	± 0.00	± 0.01	± 0.00	± 0.00		± 0.00	± 0.03	± 0.23	± 0.00
CellOut energy scale	± 0.37	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.37	± 0.00
γ -shape-mcstat-Z-SR-obs-BDTG-bin-0	± 0.25	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.25	± 0.00	± 0.00
$\alpha_{-t\bar{t}}$ GenPlusPS	± 0.18	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.18	± 0.00
αWZ Generator	± 0.14	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.14		± 0.00	± 0.00	± 0.00	± 0.00
α -syst ZX sec	± 0.11	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.11	± 0.00	± 0.00
a_JVF	± 0.10	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.02	± 0.08	± 0.00
a_PileUp	± 0.09	± 0.00	± 0.08	± 0.00	± 0.01	± 0.00	± 0.00		± 0.00	± 0.03	± 0.12	土0.00
γ _shape_mcstat_ $Wt_SR_obs_BDTG_bin_0$	± 0.08	± 0.00	± 0.08	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- WW - SR -obs-BDTG-bin-0	± 0.05	± 0.00	± 0.00	± 0.00	± 0.05	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
α -systTplusXsec	± 0.05	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
$\alpha_{-}WWGenerator$	± 0.05	± 0.00	± 0.00	± 0.00	± 0.05	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $t\bar{t}W + t\bar{t}Z + t\bar{t}WW$ - SR -obs-BDTG-bin-0	± 0.04	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
	± 0.03	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.02	± 0.00	± 0.00
$\alpha_{\rm syst}Wt{ m Xsec}$	± 0.02	± 0.00	± 0.02	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
$\gamma_{ m shape-mcstat-}WZ_SR_{ m obs-}BDTG_{ m bin-0}$	± 0.01	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.01		± 0.00	± 0.00	± 0.00	± 0.00
or svst W W Sec	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
or systif Xsec	00.0+	+0.00	+0.00	+0.00	+0.00	00.0+	+0.00		+0.00	+0.00	+0.00	+0.00
a svst W ZXsec	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
$\alpha_{\rm syst} ZZ { m Ssec}$	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat- tZ - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- H - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- DY - SR -obs- $BDTG$ -bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ _shape_mcstat_ $Fakes_SR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-ZZ-SR-obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-ZZ-VR-obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $t\bar{t}W + t\bar{t}Z + t\bar{t}WW$ - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
$\gamma_{\rm shape-mcstat-}ZZ_CR_{\rm obs-}BDTG_{\rm bin-}0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\alpha_Z Z Generator$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- DY - VR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- WW - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\gamma_{\rm shape-mcstat_t\bar{t}\bar{t}W} + t\bar{t}Z + t\bar{t}WW_{\rm s}VR_{\rm obs}BDTG_{\rm bin_0}$		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
$\gamma_{\rm shape-mcstat-Z-CR-obs-BDTG-bin-0}$		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- <i>H</i> - <i>CR</i> -obs-BDTG-bin-0		± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
$\gamma_{ m shape-mcstat}Wt_CR_{ m obs}BDTG_{ m bin}0$		+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
\sim shape mostat $t\bar{t}$ <i>CB</i> obs BDTG hin 0		00 0+	+0.00	00 0+	00 0+	000+	0000+		00 0+	00 0+	0000+	+0.00
Control of the second sec												
7-211aperillesiat-2-V A_008-DULG U_DULLU												
urranesuysu 								00.0H				
م · المسط ، متنازية ، معطم / A_snape_mcstat_tz / A_obs_nc	00.0∏	00.0∏	nn.n - +	10.00 1	00.0∏	00.0∏	00.0∏		00.0 <u>∓</u>	00.0∏	00.0 H -	00.0∏
γ -shape-mcstat-W t-V t-00S-DULG-DULG	00.0H-	00.0H	00.0 H -	00.0H	00.0H	00.0H	00.0H		00.0H	00.0H	00.0 H -	00.0H
γ-shape-mcstat- <i>Fakes-V K</i> -obs-BD T G-bin-U	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	± 0.00		±0.00	±0.00	# 0.00	±0.00
γ -shape-mcstat- WZ_CK -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat-tZ-CR-obs-BDTG-bin-U	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	± 0.00	±0.00
γ -shape-mcstat- $H_V R_o$ obs_BD'I'G_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- $Fakes$ - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ $t\bar{t}$ _ VR _obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- WW - VR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
$\gamma_{\rm shape-mcstat-DY-CR-obs-BDTG-bin-0}$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
\sim shane mostat WZ VR obs BDTG hin 0	00 0+	00 0+	000+				-		- 00	-		000
									Ŧ	Ŧ		

Table 60: Breakdown of the dominant systematic uncertainties on background estimates in SR_2^{SF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

	£,-2											
Total background expectation	3.85	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.00	0.72	2.98	0.00
Total background error	± 1.35	土0.00	土0.04	±0.00	土0.06	± 0.01	± 0.06	土0.05	±0.00	土0.78	± 1.07	土0.00
o.ZGenerator ∵shape_mestat_ <i>ttSR_</i> obs_BDTG_bin_0	$\substack{\pm 0.72\\\pm 0.62}$	±0.00 ±0.00	±0.00 ±0.00	±0.00 ±0.00	±0.00 ±0.00	±0.00 ±0.00	±0.00 ±0.00	土0.00 土0.00	±0.00 ±0.00	$\pm 0.72 \pm 0.00$	$\pm 0.00 \pm 0.62$	±0.00 ±
∞_ttISRFSR Tet energy scale	± 0.57 ± 0.55	+0.00 +0.00	+0.00	±0.00 +0.00	00.00 +0.00	0.00 +	+0.00	+0.00 +0.00	±0.00 +0.00	±0.00 +0.11	± 0.57 ± 0.44	+0.00 +0.00
active sectors and sec	± 0.30	±0.00 ±0.00	±0.00	±0.00	±0.00	±0.00 ±0.00	土0.00		±0.00	土0.00	土0.30	10.00
Jet energy resolution	± 0.29	十0.00	± 0.04	±0.00	±0.00	土0.00	土0.00	± 0.02	±0.00	土0.08	± 0.35	土0.00
7_shape_mcstat_Z_SR_obs_BDTG_bin_0	± 0.24	0.00 +	+0.00 +	0.00	00.00 +	0.00 + +	+0.00	±0.00 +0.00	±0.00	± 0.24	++0.00 ++	00.00 +
cendut energy resolution or syst Z X sec	+0.11	00.01	+0.00	+0.00	+0.00	00.01 +0.00	+0.00		+0.00	+0.01	00.01 +0.00	00.00 +0.00
$\alpha_{-}t\bar{t}GenPlusPS$	土0.11	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00		土0.00	土0.00	土0.11	土0.00
CellOut energy scale	± 0.07	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.07	± 0.00
aJVF	± 0.06	土0.00	土0.00	±0.00	±0.00	±0.00	土0.00		土0.00	± 0.02	± 0.04	土0.00
$\alpha_{-}WW$ Generator	±0.06	±0.00	±0.00	±0.00	±0.06	00.00 	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
۵-۱۷ ۵ Generator ۵۰ Dilalta	00.01 +0.06	8.0 H +	00.0 H	00.04	00.0	8.0 H H	000 H +	±0.00	00.0H	10.00 +0.03	00.0 1 1 0 0 0 1 0 0 1 0 0 1	00.0H
$\gamma_{-shape_mcstat_t\bar{t}W + t\bar{t}Z + t\bar{t}WW_SR_obs_BDTG_bin_0$	± 0.03	±0.00	±0.00	±0.00	+0.00	±0.00	±0.00	± 0.03	十0.00	±0.00	00.0±	±0.00
α syst Tplus X sec	± 0.03	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
Lumi	± 0.02	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	± 0.02	±0.00	±0.00
7_slidpe_licsidi_W_Z_J_A_OUS_D_I_G_D_I_G_DII_U	10.01 +0.01					80.0H	10.0H		00.0H		8.0	
a_svsttZXsec	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		十0.00	±0.00	+0.00 +	±0.00
$\gamma_{-shape-mcstat-H-SR_obs-BDTG_bin_0}$	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00		± 0.00	± 0.00	± 0.00	土0.00
α -syst W ZX sec	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
$\mathrm{mu}_{-}t\bar{t}\mathrm{SF}$	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00		土0.00	土0.00	土0.00	土0.00
a_systWtXsec	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
a syst W W Asec	00.0∏	00.0 1 1	00.01 + 0.00	00.0 1 1 1 0 0 0 1	00.0∏	00.0 1 1	00.01 ₩		00.0 1 1 0 0 0 1	00.01 +000	0.04 H H	00.04 1
∝syst∠z Asec ~ shane mostat 47 SR obs BDTG bin 0	00.01 +0.00	8.0	00.0 +	00.01	00.01	00.00	0000+	00.01 +0.00	00.01 +	00.01	00.0 H +	00.04
γ -shape-mcstat- DY - SR -obs- $BDTG$ -bin-0	±0.00	±0.00	土0.00	±0.00	+0.00	±0.00	±0.00		+0.00	+0.00	±0.00	±0.00
γ -shape-mcstat- $WWSR_{obs}$ -BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_ $Wt_SR_obs_BDTG_{bin_0}$	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ_shape_mcstat_ZZ_SR_obs_BDTG_bin_0	±0.00	00.04 +	±0.00	10.00 00.01	±0.00	00.00 + +	10.00 +	+0.00	100.00 00.01	±0.00	0.00 + +	00.00 + +
γ -snape-mcstat- <i>F akes_5 k</i> _obs_ <i>BU</i> 1G-bm_U \sim share mcstat $t\overline{t}W \perp t\overline{t}Z \perp t\overline{t}WW CR$ she BDTC hin D	00.0 1 1 0 0 0 0 1 1 0 0 0 1 1	8.0 ₩	00.0 ₩	00.0#	00.0 ₩	8.0 H +	00.0 +		00.0#	00.0	00.0 ₩	0.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
γ shape mestat $ZZ CR$ obs BDTG bin 0	+0.00	00.01+	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
γ -shape_mcstat_ $DY_VR_obs_BDTG_bin_0$	±0.00	±0.00	土0.00	±0.00	+0.00	±0.00	±0.00		+0.00	+0.00	±0.00	±0.00
$\gamma_{\rm shape-mcstat-}WW_CR_{\rm obs-}BDTG_{\rm bin-}0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW_VR_obs_BDTG_bin_0$	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	土0.00	土0.00		± 0.00	± 0.00	土0.00	土0.00
γ -shape-mcstat- $Z_{-}CR_{-}$ obs-BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	+0.00	±0.00	±0.00		±0.00	+0.00	±0.00	±0.00
γ-shape_mcstat_H_CR_obs_BDTG_bin_0	±0.00	00.0 ₩	±0.00	±0.00	±0.00	#0.00	± 0.00		±0.00	±0.00	00.0 ₩	±0.00
γ-shape_mestat_W v_C Λ_UDS_DD I G_DIII_0 × shano mestat 77 V/P ohe BDTC hin 0												
v shane mestat Z VR obs BDTC bin 0	00.01 +0.00	8.04	00.0H	00.04	00.01	80.0H	00.04		00.04	00.01	8.0	00.04
/	+0.00	00.0+	+0.00	+0.00	0000+	0.00+	+0.00		0.00+	00.0+	00.04	00.01
γ -shape-mcstat- tZ - VR -obs-BDTG-bin-0	±0.00	十0.00	土0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	十0.00	±0.00
$\gamma_{\rm shape-mcstat}Wt_VR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- $Fakes-VR$ -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- WZ - CR -obs-BDTG-bin-0	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	土0.00	土0.00		± 0.00	± 0.00	± 0.00	土0.00
γ -shape-mcstat- tZ - CR -obs_BDTG-bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat_tt_CR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat-H-V R-obs-BD'I'G-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- $Fakes-CR_obs-BD'I'G_bin_0$	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat-tt-V R_obs_BDTG_bin_0	±0.00	00.01	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	00.01
γ -shape-mcstat- $WW-VR$ -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat- DY - CR -obs- $BDTG$ -bin-0	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	00.01
\sim shape mostat WZ_VR obs BDTG bin 0												

Table 61: Breakdown of the dominant systematic uncertainties on background estimates in SR_3^{SF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Uncertainty of channel	5113											
Total background expectation	2.95	0.00	0.00	0.00	0.00	0.00	0.01	0.12	0.00	0.72	2.08	0.00
Total background error	± 0.99	±0.00	± 0.04	±0.00	± 0.06	± 0.01	± 0.06	土0.05	±0.00	±0.78	± 0.63	土0.00
a.ZGenerator ∞ e/senerator + 7 SR ohe RDTG hin 0	± 0.72 ± 0.43	00.00 +0.00	±0.00	±0.00 10.00	±0.00 ±0.00	00.00 +0.00	±0.00 +0.00	中 10.00 10.00	00.04 40.00	±0.72 +0.00	± 0.00	±0.00
Jet energy scale	± 0.42	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		± 0.00	± 0.01	± 0.30	+0.00
$\alpha_{-t}\overline{t}$ ISRFSR	± 0.35	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.35	± 0.00
$mu_t \bar{t}SF$	± 0.28	土0.00	土0.00	土0.00	土0.00	土0.00	土0.00		土0.00	土0.00	± 0.28	±0.00
γ -shape-mcstat-Z-SR-obs-BDTG-bin-0	± 0.24	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	± 0.24	±0.00	±0.00
a_systttXsec	± 0.21	00.00	±0.00	10.00 00.01	±0.00	00.00	+0.00	± 0.00	±0.00	100.00 +0.00	± 0.21	00.0
Jet effergy resolution α syst ZX ser	91.0 +	8.0 H +	H 0.04	00.0H	00.0H	8.0 H +	00 00 +		00.0H	90.04 11	+0.00+	00-04 H +
CellOut energy resolution	+0.08	00.01+	+0.00	+0.00	+0.00	00.01+	+0.00	00.0+	+0.00	+0.02	+0.10	+0.00
or <i>tf</i> GenPlusPS	+0.07	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.07	+0.00
$\alpha_{-}WW$ Generator	±0.06	十0.00	十0.00	十0.00	±0.06	十0.00	±0.00		十0.00		±0.00	±0.00
αWZ Generator	± 0.06	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.06		± 0.00		± 0.00	± 0.00
a_PileUp	± 0.05	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.03	± 0.02	± 0.00
a_JVF	± 0.05	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.02	± 0.03	± 0.00
CellOut energy scale	± 0.05	±0.00	±0.00	±0.00	土0.00	±0.00	± 0.00		土0.00	土0.00	± 0.05	±0.00
γ -shape_mcstat_ttW + ttZ + ttWW_SR_obs_BDTG_bin_0	± 0.03	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
α_syst I plusAsec	±0.03	0.04 1	00.0 + + 0.00	00.0	00.0 1 1 0 0 0 0 1	0.04 1	00.01 1	±0.03	00.01 1	00.0	0.0 ₩	0.0 ₩
\sim shane mostat WZ SR obs RDTC bin 0	10.0+	8.04		000+		8.04	0.01		00.0+	10.01	800+	000+
αZZ Generator	+0.01	+0.00	+0.00	+0.00	+0.00	+0.01	+0.00		+0.00	+0.00	+0.00	+0.00
$\alpha_{\mathrm{-Syst}} t Z \mathrm{Xsec}$	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00		± 0.00	± 0.00	土0.00	土0.00
γ -shape-mcstat-H-SR_obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
a_systWZXsec	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
α -syst $WtXsec$	土0.00	土0.00	± 0.00	土0.00	土0.00	土0.00	± 0.00		土0.00	土0.00	土0.00	土0.00
α -systZZXsec	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	+0.00		±0.00	±0.00	±0.00	±0.00
arsyst W W Xsec	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	+ 0.00		±0.00	±0.00	±0.00	±0.00
γ-snape-mcstat- <i>tz -5</i> .π-obs-BD 1 G-Dm-0	10.00	00.0 ∏ +	00.0 1 1 1 0 0 0 0 1	00.0 1 1 1 0 0	00.0∏ +	00.0 ∏ +	00.0 ∏ +	±0.00	00.01 10.00	00.0∏	00.0 ₩	00.0
v shane mostat DV SR ohs BDTG hin 0	00.0+	8.0	0000+	000+	00.04	8.0	0000+		00.0+		00.0+	0000+
γ -shape-mcstat-ZZ_SR_obs_BDTG_bin_0	+0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00		±0.00	±0.00	+0.00	±0.00
$\gamma_{\text{-shape-mcstat-}}Wt_SR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00		± 0.00	± 0.00	土0.00	土0.00
γ -shape-mcstat- WW - SR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ _shape_mcstat_ZZ_VR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW_CR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00		± 0.00	± 0.00	土0.00	±0.00
γ -shape_mcstat_ZZ_CR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat_ $DY_VR_{obs}BDTG_{bin_0}$	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ_shape_mcstat_W W_CK_obs_BDTG_bm_U	±0.00	00.0 ₩	± 0.00	±0.00	±0.00	00.0 ₩	± 0.00		±0.00	±0.00	#0.00 ₩	00.0 ₩
γ -shape-mcstat_tt W + tt Z + tt W W -V K_ODS_BUTG_DIN_U	±0.00	00.0 1 1 1	± 0.00	00.0∏	±0.00	00.0 1 1 1	00.01 +	±0.00	±0.00	00.0	00.0 ₩	00.0
7-shape_mcstat_Z_C_A_UDS_DD_I G_DIII_U & shape mcstat_H_C_R_ohs_RDTC_hin_D	00.0H	8.0 H +		00.0H		8.0 H +	00.0H				00.0 H +	8.0 H +
× shape mostat Wt CR obs BDTG hin 0	00.0+	0000+	000+	000+	00 00+	0000+	000+		00.0+		000+	000+
γ shape mostat $t\bar{t}$ CR obs BDTG bin 0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
\sim -shape-mostat-Z-VR-obs-BDTG-bin-0	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		+0.00	+0.00	+0.00	+0.00
α -FakesSyst	土0.00	±0.00	土0.00	土0.00	土0.00	±0.00	±0.00		土0.00	± 0.00	±0.00	±0.00
γ -shape-mcstat- tZ_VR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
γ -shape-mcstat- $Wt_VR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00		± 0.00	± 0.00
γ -shape-mcstat- $Fakes_VR$ -obs_BDTG-bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00		± 0.00	± 0.00
γ -shape-mcstat- WZ - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- tZ - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00		± 0.00	± 0.00	±0.00	±0.00
γ -shape_mcstat_H_VR_obs_BDTG_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	00.01	00.01
γ -shape-mcstat- $Fakes$ - CR -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00	±0.00	±0.00
γ_shape_mcstat_ <i>tt¯VR_</i> obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00		± 0.00	± 0.00	±0.00	±0.00
γ -shape-mcstat- $WW_VR_obs_BDTG_bin_0$	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- DY - CR -obs-BDTG-bin-0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\sim chose = m_{control} 11/7 1/D = cho DDTC him D$												

Table 62: Breakdown of the dominant systematic uncertainties on background estimates in SR_3^{SF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

d expectation d error <i>tf_SR_</i> obs_BDTG_bin_0 scale r	6.00 0.01	0.08	0.03	0.92	0.83	0.74	0.32	0.00	0.11	2.95	0.00
obs.BDTG_bin_0											
2.obs.BDTG.bin.0		2 ± 0.13	± 0.03	± 0.53	土0.47	± 0.50	±0.09	± 0.53	± 0.23	± 1.09	±0.00
2.obs_BDTG_bin_0			00 0+	40 06	00 0+	+0.05	+0.01	+0 5	00 0+	40 04	00 0+
R.obs.BDTG.bin_0				± 0.00	+0.00	± 0.00	± 0.00	$\pm 0.00 \pm$	+0.00	± 0.62	+0.00
		0 ±0.00		± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.61	土0.00
				± 0.02	± 0.01	± 0.03	± 0.00	± 0.12	± 0.01	± 0.43	± 0.00
				± 0.04	± 0.05	± 0.08	± 0.03	± 0.03	土0.06	± 0.24	土0.00
		0 ±0.00		± 0.46	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
			±0.00	±0.00	± 0.44	±0.00	±0.00	±0.00	±0.00	±0.00	0.00 ₩
tor	±0.42 ±0.0			00.0±	00.0 1 1	±0.42	10.00 10.00	00.0	00.0 1 1 1 0 0 0 0 0 1	00.0 1 00.0 1	00.0 1 1
	-29 ±0.00			00.01 1	B.04	00.0 H +	±0.00 +0.00	00.0H	00.0H	H 0000	8.0 H +
\sim shape mostat $WZ SR$ ohs BDTG hin 0 +0.	+0.20 $+0.0$	0000+		+0.00	0.00+	+0.20	+0.00	+0.00	+0.00	0.00+	+0.00
				± 0.11	±0.08	± 0.12	土0.00	± 0.08	± 0.19	± 0.24	±0.00
				± 0.03	± 0.03	± 0.02	± 0.01	± 0.00	± 0.00	± 0.09	土0.00
solution				± 0.06	± 0.00	土0.07	± 0.02	± 0.00	± 0.01	± 0.14	± 0.00
	$\pm 0.12 \pm 0.00$			± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.12	± 0.00
$t_ZZ_SR_obs_BDTG_bin_0$				±0.00	± 0.12	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
enerator				#0.00	±0.00	±0.00	±0.00	±0.00	±0.11	00.0 ₩	±0.00
Lumi ~ shana mestat IV+ SR ohs RDTC hin 0 +0				20.0H	70.07 H H	70.07 H 0 0 H	10.01 +0.00	00.0H			8.0H
	+0.07 +0.04	0000+	+0.00		0.01	0.00 + 0.00	+0.07	+0.00	+0.00	00.0+	00.01 +0.00
					土0.04	± 0.03	±0.00	±0.00	土0.01	± 0.01	土0.00
					± 0.00	± 0.05	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape_mcstat_t $tW + ttZ + ttWW$ _SR_obs_BDTG_bin_0 ± 0				十0.00	±0.00	±0.00	± 0.05	±0.00	十0.00	±0.00	±0.00
				±0.00	±0.00	±0.00	±0.00	±0.00	± 0.05	±0.00	±0.00
$\alpha_{\text{sust}} N W \text{ Asec} \qquad \pm 0$	10.01 ±0.00	00 ± 000	00.0#	00.0 1 1 0 0 0 1	0.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	00.0 1 1 1 0 0 0 1 1 0 0 0 1	±0.00	00.0	00.0 1 1 1 0 0 0 1	00.0 ₩ +	00.0 1 1 1
$tH_SR_{obs}BDTG_{bin}0$				±0.00	±0.01	±0.00	± 0.00	±0.00	±0.00	+0.00 +	±0.00
					± 0.00	± 0.00	± 0.00	± 0.00	± 0.02	± 0.00	土0.00
					土0.00	± 0.00	± 0.00	± 0.00	土0.00	土0.00	土0.00
c	± 0.01 ± 0.01			±0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	±0.00	±0.00
γ_snape_mestat_tz_2 f. 008_DD 1 G_Dm_0 mu_tfSF			00.0H	00.0H	00.0 H	00.0 H +	±0.00	00.0H	00.0H	00.0 H +	00.0 H +
$mcstat_Fakes_SR_obs_BDTG_bin_0$	±0.00 ±0.0	0 ±0.00			土0.00	土0.00	土0.00	±0.00	土0.00	±0.00	土0.00
	$\pm 0.00 \pm 0.00$				± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
					± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
	±0.00 ±0.0			十0.00	±0.00	±0.00	± 0.00	±0.00	±0.00	十0.00	±0.00
				±0.00	00.0 ₩	± 0.00	±0.00	00.0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	#0.00	00.0	±0.00
					8.0 H +	00.0 H H	±0.00	00.0H			8.0H
				+0.00	0.01	0.00 + 0.00	+0.00	+0.00	+0.00	00.0+	00.01 +0.00
γ -shape-mestat- <i>H</i> - <i>CR</i> -obs-BDTG-bin-0 ± 0					±0.00	±0.00	十0.00	±0.00	±0.00	±0.00	±0.00
					± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
	土0.00 土0.00				±0.00	土0.00	十0.00	±0.00	土0.00	土0.00	±0.00
n-0				±0.00	#0.00	± 0.00	± 0.00	±0.00	#0.00	00.0 ₩	±0.00
at_Z_V R_obs_BD'IG_bin_0	±0.00 ±0.0	0.00 + # 0.00	10.00 +	100.00 1	0.0 1 1	± 0.00	±0.00	00.04 +	10.00 +	00.0 1 1	00.0∏
					8.0 H +	0.00 H +	±0.00 +0.00	00.0H			8.0 H +
\sim shape mestat $t\bar{t}$ <i>CR</i> oks RDTC bin 0 ± 0				00.0+	8.0	0000+	00.0+	000+		00.0+	8.04
				± 0.00	+0.00	+0.00	± 0.00	± 0.00	± 0.00	+0.00	+0.00
γ -shape-mcstat- $Fakes_V R$ -obs-BDTG-bin-0 ± 0				± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
				± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00
				± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
				土0.00	±0.00	±0.00	土0.00	±0.00	土0.00	土0.00	±0.00
				土0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
				#0.00	#0.00	±0.00	±0.00	±0.00	#0.00	00.0 ₩	00.0 ₩
γ -snape-mcstat- DT - CR -obs- $BDIG$ -DIG-DID-U \sim shane mostet $W/W VR$ ohs BDTC hin 0 ± 0			00.0#	00.0#	B.0 ₩	0.0 1 1	±0.00 +0.00	00.0 ₩	00.0#	00.0 H +	0.0 ₩
00 in_0	±0.00 ±0.00	00 ± 0.00		±0.00	±0.00	±0.00	十0.00	±0.00	±0.00	±0.00	±0.00

Table 63: Breakdown of the dominant systematic uncertainties on background estimates in SR_4^{SF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Uncertainty of channel	SR_4^-	7	2 14		AA AA	2	7	ttW + ttZ + ttW W	1	I	2	
Total background expectation	6.33	0.01	0.08	0.03	0.93	0.83	0.74	0.32	0.00	0.11	3.27	0.00
Total background error	± 1.57	± 0.02	± 0.13	± 0.03	± 0.52	土0.47	± 0.50	±0.09	± 0.53	± 0.23	± 1.03	±0.00
Jet energy scale $lpha \cdot t \tilde{t}_{\rm C}$ scale $lpha \cdot t \tilde{t}_{\rm C}$ and $t \tilde{t}_{\rm C}$ scale $\gamma_{\rm c}$ shape_mestat_ $t \tilde{t}_{\rm L} SR_{\rm obs}$. BDTG-bin_0	± 0.71 ± 0.69 ± 0.67	十 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	++0.00 ++0.000	10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00 10.00	10.06 10.00 10.00 10.00	十 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	+ 0.05 + 0.00 - 10.00	±0.01 ±0.00	±0.51 ±0.00	10.00 10.00 10.00	10.08 10.08 10.67	年 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00 10:00
CellOut energy scale &_PileUp	± 0.60 ± 0.49	±0.00 ±0.00	± 0.00 ± 0.10	± 0.00	± 0.02 ± 0.04	± 0.01	± 0.03 ± 0.08	± 0.00	± 0.11 ± 0.03	± 0.01 ± 0.06	± 0.47 ± 0.26	±0.00
mu_ttSF α_WWGenerator	$\pm 0.46 \pm 0.46$	±0.00 ±0.00	± 0.00 ± 0.00	±0.00 ±0.00	$\pm 0.00 \pm 0.46$	±0.00 ±0.00	± 0.00 ± 0.00	± 0.00 ± 0.00	± 0.00 ± 0.00	±0.00	± 0.46 ± 0.00	±0.00
$lpha_Z Z$ Generator	土0.44 土0.41	00.00 +	±0.00 ±	±0.00	+0.00	±0.44	±0.00	十0.00	+0.00 +0.00	±0.00 ±0.00	+0.00 +	±0.00
α_W Z Generauor α_syst#TSec	± 0.32	00.01 10.00	王 0.00 1	±0.00	±0.00	00.01 ±0.00	王0.01 王0.00	±0.00 ±0.00	00.00 ±0.00	±0.00 ±	± 0.32	±0.00 ±0.00
Jet energy resolution \sim shane mostat $WW~SR$ obs BDTG bin 0	± 0.22 ± 0.21	± 0.01	± 0.00 ± 0.00	±0.00 +0.00	± 0.11 ± 0.21	±0.08	± 0.12 ± 0.00	+0.00 +0.00	± 0.08 ± 0.00	± 0.19 ± 0.00	± 0.27 ± 0.00	±0.00 +0.00
γ_{-} shape_mcstat_WZ_SR_obs_BDTG_bin_0	±0.20	十0.00	±0.00	+0.00 +	±0.00	00.00 1 + 0.00	± 0.20	±0.00	十0.00	+0.00	中 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	0.00 1 1 1
c-trigger CellOut energy resolution	王0.13 土0.17	王0.01 王0.01	王 0.00	± 0.01	±0.06	±0.00	王U.02 王0.07	± 0.02	王U.U0 王0.00	±0.01	± 0.15	±0.00 ±0.00
lpha-ttPartonShower γ -shape-mcstat_ZZ_SR_obs_BDTG_bin_0	± 0.13 ± 0.12	±0.00	± 0.00 ± 0.00	± 0.00	±0.00 ±0.00	± 0.00 ± 0.12	± 0.00	土0.00 土0.00	±0.00 ±0.00	±0.00 ±0.00	± 0.13 ± 0.00	±0.00 ±0.00
∝_ZGenerator	± 0.11	±0.00	土0.00	土0.00	±0.00	±0.00	±0.00	十0.00	±0.00	± 0.11	±0.00	中 10.00 1
$\gamma_{ m shape-mcstat}Wt_SR_obs_BDTG_bin_0$	±0.03 ±0.08	00.01 10.00	±0.08	±0.00	±0.00	±0.00 ±	±0.02	王0.00 十	±0.00 ±	±0.00 ±	±0.00	00.00 ±0.00
orsystTplusXsec	土0.07 土0.06	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	十0.07	±0.00	±0.00	±0.00	±0.00
α_{-} v r α_{-} svst WZX sec	± 0.05	00.0±	王 0.00 王 0.00	10.00 10.00 10.00	10.00 年 0000	于0.00 10.00	± 0.05	五0.00 10.00	±0.00 ±0.00	10.00 年 00.00	10.00	00.01 ±0.00
γ -shape-mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW$ -SR-obs-BDTG-bin-0	± 0.05	±0.00	±0.00	±0.00	±0.00	10.00 10.00	土0.00	± 0.05	±0.00	土0.00	±0.00	±0.00
γ_snape_mestat_z_2.R_obs_BD1G_D1u_0 α_syst W W Xsec	±0.05	00.01 ±0.00	±0.00	±0.00	±0.05	00.0±	±0.00	五0.00 十0.00	00.01 ±0.00		±0.00	00.0±
α systZZXsec	±0.04	±0.00	±0.00	±0.00	±0.00	±0.04	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ_suppermeetation of the output to the output of the outp	± 0.02	00.0±	±0.00	±0.00	±0.00	00.01 10.00	王 0.00 1	十0.00	±0.00 ±0.00		五 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	10.00 10.01 10.01
a systWtXsec	± 0.02	±0.00	± 0.02	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
$lpha$ -sysuit Δ sec γ -shape-mcstat $_{-}tZ_{-}SR_{-}$ obs_BDTG_bin_0	王0.01 王0.01	±0.01	±0.00	±0.00	±0.00	00.01 ±0.00	±0.00	王U.00 土	±0.00 ±		±0.00	00.01 ±0.00
$\alpha_{-t}\bar{t}$ ISRFSR	±0.00	±0.00	土0.00	±0.00	±0.00	±0.00	土0.00	±0.00	±0.00		±0.00	±0.00
γ -snape-mcstat $_D$ r $_D$ R $_O$ bs $_D$ DTG $_D$ l G Din $_O$ γ _shape-mcstat $_Fakes_SR_O$ bs $_BDTG_D$ bin $_O$	±0.00	00.0 1 10.00	±0.00	±0.00	±0.00	00.01 ±0.00	±0.00	五0.00 十0.00	±0.00	±0.00 ±0.00	±0.00	00.01 ±0.00
γ -shape-mcstat_ $t\bar{t}W + t\bar{t}Z + t\bar{t}WW$ _CR_obs_BDTG_bin_0	10.00 10.00	±0.00	土0.00	±0.00	±0.00	10.00 10.00	土0.00	十0.00	土0.00	±0.00	±0.00	±0.00
γ_snape_mcstat_ΔZ_CK_obs_DULG_bin_0 γ_shape_mcstat_DY_VR_obs_BDTG_bin_0	±0.00	00.0±	±0.00	±0.00	±0.00	00.01 ±0.00	±0.00	王0.00 十	±0.00 ±	王U.UU 王	±0.00	00.01 ±0.00
γ -shape-mcstat- WW - CR -obs-BDTG-bin-0	土0.00	±0.00	土0.00	土0.00	土0.00	±0.00	土0.00	±0.00	土0.00	土0.00	土0.00	土0.00
γ -shape-mcstat- <i>ttW</i> + <i>ttZ</i> + <i>ttWW</i> - <i>VR</i> -obs- <i>BD</i> 'I'G-bin-0 \sim shape mcstat <i>Z CR</i> obs BDTG bin 0	±0.00 +0.00	00.00 +0.00	±0.00 +0.00	±0.00 +0.00	±0.00 +0.00	00.00 +0.00	±0.00 +0.00	±0.00 +0.00	±0.00 +0.00	±0.00 +0.00	±0.00 +0.00	±0.00 +0.00
γ -shape-mcstat_H_CR_obs_BDTG_bin_0	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00		± 0.00	± 0.00
γ -shape-mcstat- $Wt-CR_{obs}$ -BDTG-bin-0 \approx share mostet $t\bar{t}$ CR_{obs} BDTC bin 0	±0.00	00.00 +	+0.00 +	±0.00	±0.00	±0.00	+0.00	±0.00 +0.00	±0.00	±0.00 +0.00	±0.00	±0.00
γ -shape-mestat- Z - V R-obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	年0.00 年	±0.00	±0.00	±0.00	±0.00
α -FakesSyst	土0.00	土0.00	土0.00	±0.00	土0.00	土0.00	土0.00	±0.00	土0.00	土0.00	土0.00	土0.00
7_shape_mcstat_tZ_VR_obs_BDTG_bin_0	±0.00	0.00 ++0.00	±0.00 +	±0.00	00.00 +	00.00 1 + 0.00	+0.00 +	+0.00 +0.00	±0.00	00.00 +0.00	0.00 ++	00.00 1 + 0.00
γ -shape-mestat- $W t_{-}V R_{-}$ obs-BDTG-bin-0	土0.00 土0.00	±0.00	±0.00	十0.00	±0.00	10.00	十0.00 1 0 0 0 0 0 0 0 0 0 0 0 0 0	十0.00	±0.00	土0.00	±0.00	十0.00
γ -shape-mcstat- <i>Fakes-VR</i> -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ_snape_mestat_W Z_CR_obs_BDTG_bin_0 ~ shape_mestat_tZ_CR_obs_BDTG_bin_0	00.01 +0.00	00.0 ₩ 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 00.0 0.	00.00 +0.00	+0.00	00.00 +0.00	00.0 1 10.00	00.00 +0.00	±0.00 +0.00	00.0 10.00 00.0 00.0 +0.00 00.0 +0.00 00.0 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00	00.00+	00.0 1 1 0.00	00.0 +0.00
γ -shape-mcstat- <i>H</i> - <i>VR</i> -obs-BDTG-bin-0	± 0.00	±0.00	土0.00	土0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	± 0.00	±0.00	±0.00
γ -shape-mcstat- <i>Fakes-CR</i> -obs-BDTG-bin-0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	十0.00	±0.00	±0.00	±0.00	±0.00
γ -shape-mcstat-tt-V K-obs_BD TG-bin-0 \sim shape mcstat DY CR obs BDTG bin 0	±0.00 +0.00	00.0 +0.00	00.00 +0.00	±0.00 +0.00	00.00 +0.00	00.0 1 00.0 0 0 0 0 0 0 0 0	±0.00 +0.00	±0.00 +0.00	00.0 10.00 00.0 00.0 +0.00 00.0 +0.00 00.0 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00 +0.00	00.0 + 0.00 +	00.0 1 1 0.00 1	00.0 +0.00
γ -shape-mcstat_ WW_VR -obs_BDTG_bin_0	± 0.00	±0.00	± 0.00	±0.00	± 0.00	±0.00	± 0.00	± 0.00	±0.00	± 0.00	±0.00	±0.00
γ_shape_mcstat_W Z_V R_obs_BD'I'G_bin_0	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	00.04			

Table 64: Breakdown of the dominant systematic uncertainties on background estimates in SR_4^{SF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Total background expectation	5.42	0.01	0.34	0.00		0.19	0.13	0.33	0.23	0.10	3.84	0.00
-												
Total background error	± 1.92	土0.01	± 0.35	±0.00	± 0.24	± 0.21	± 0.24	± 0.10	± 0.27	± 0.13	± 1.77	±0.00
	±1.27	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 1.27	±0.00
γ -shape-mcstat- $t\bar{t}$ - SR -obs-BDTG-bin-0	± 0.70	土0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.70	± 0.00
CellOut energy scale	± 0.63	±0.00	±0.00	土0.00	± 0.02	±0.01	±0.00	±0.01	±0.00	±0.00	± 0.61	±0.00
CellOut energy resolution	± 0.56	±0.00	±0.00	±0.00	±0.00	±0.01	± 0.06	±0.01	±0.00	±0.00	±0.50	±0.00
a_PileUp		±0.00	± 0.02	±0.00	±0.00	±0.00	± 0.08	±0.00	± 0.14	±0.01	± 0.31	±0.00
α -systttXsec	±0.38	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		± 0.38	±0.00
γ -shape-mostat-W t-5K-obs-BUTG-bin-0		00.04	±0.34	±0.00	±0.00	00.0 	± 0.00	±0.00	±0.00	±0.00	00.0 ₩	0.0 1 1
γ_snape_mcstat_Dr_SR_ops_BD1G_pin_0	±0.23	00.04	00.01 +	00.0 1 1 1 0 0 0 1	±0.00	0.0 10.0 10.0	±0.00	±0.00	±0.23		±0.00	0.0 ₩
Jet energy resolution					1000 100 100 100	10.0H	10.0H	40.04 40.00			10.01 H + 0.01	8.0 H +
arm z ZCanarator	+0.50				000+	000+	0000+	00.0+	000+	000+	800+	000
∞ WWGenerator		8.04	000	00.0+	+0.17	07.0+	000+	00.0+	00.0+	00.0+	0.0	0.04
art the deniest and the second account of the second account a		0.04	+0.01	00.04	100+		000+	+0.01	+0.01	000+	+0.19	000
$\alpha_{-t\bar{t}}$ PartonShower		+0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	+0.00	± 0.00	± 0.00	± 0.15	± 0.00
Jet energy scale		±0.00	± 0.00	± 0.00	± 0.01	± 0.01	± 0.01	±0.00	± 0.00	± 0.00	± 0.16	± 0.00
γ -shape-mcstat- WW - SR -obs-BDTG-bin-0		土0.00	± 0.00	± 0.00	± 0.11	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
$\alpha_z Z$ Generator		±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.10	± 0.00	± 0.00
$Z_SR_{obs}BDTG_{bin_0}$		±0.00	土0.00	土0.00	± 0.00	± 0.00	± 0.00	±0.00	土0.00		±0.00	土0.00
	± 0.07	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.07	±0.00		±0.00	±0.00
t_WZ_SR_obs_BDTG_bin_0		±0.00	±0.00	±0.00	±0.00	±0.00	± 0.07	±0.00	±0.00		±0.00	±0.00
α -systw tAsec	10.01 +0.01	0.04	10.01 1	00.0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	00.0∏	00.0∏ +	00.01 +	10.00 +0.000	00.0∏ +	00.0 1 1 1 0 0 1	00.0 ₩	0.0 ₩ +
be BDTC bin 0					00.0H	8.0 H H	00.0H	20.0H			8.0 H +	
		+0.00	± 0.01	+0.00	± 0.01	± 0.01	± 0.00	± 0.01	± 0.01	± 0.00	+0.00	± 0.00
$\alpha_{\rm syst} Z X \sec$		±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.01	±0.00	± 0.00
α -syst WW Xsec		± 0.00	± 0.00	± 0.00	± 0.01	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
		±0.00	±0.00	±0.00	±0.00	± 0.01	±0.00	十0.00	±0.00	±0.00	±0.00	±0.00
V Z X sec	± 0.01	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.01	±0.00	±0.00	±0.00	±0.00	±0.00
α_JVF Δ. sust+7 Υνορο		00.0 1	00.01 ₩	00.0 	10.01 + 0.01	B.0 ₩	10.03		00.01 1		±0.04	B.0 ₩
\sim shape mostat tZ SR obs BDTG hin 0		+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
$m_{\rm Lt} {\rm FF}$		±0.00	土0.00	土0.00	± 0.00	±0.00	±0.00	±0.00	土0.00	土0.00	±0.00	土0.00
γ -shape-mcstat-H-SR-obs-BDTG-bin-0	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00
-bin_0		±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00
obs_BDTG_bin_0	土0.00	±0.00	土0.00	土0.00	土0.00	土0.00	±0.00	十0.00	土0.00	土0.00	±0.00	土0.00
		±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
γ -shape_mcstat_ $DY _V K$ -obs_ $BDTG$ _bin_0	±0.00	00.0∏	00.01 + 0.00	±0.00	±0.00	00.0 1 -	10.00 	±0.00	#0.00	±0.00	00.0 ₩	00.0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0
γ -shape_mcstat_W W _C R_008_DD 1 G_011_0 \sim share mcstat_HIX \downarrow $+\overline{t}R \perp +\overline{t}IN/1N$ $\downarrow VR$ obs RDTC hin 0					00.0H	B 0 H +	00.0H				0.0 H +	
γ shape mostat Z CR obs BDTG bin 0	00.0+	0.04	000+	00.0+	00.0+	8.04	000+	00.0+	00.0+	000+	8.0+	0.0
γ -shape-mestat- $H_CR_obs_BDTG_bin_0$		±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	十0.00	±0.00		±0.00	±0.00
$\alpha_{-t\bar{t}ISRFSR}$	± 0.00	±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00		± 0.00	± 0.00
γ -shape-mcstat- $WtCR$ obs-BDTG_bin_0		±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	土0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat-ZZ-VR-obs-BDTG-bin-0		±0.00	±0.00	±0.00	± 0.00	±0.00	± 0.00	十0.00	±0.00	± 0.00	±0.00	±0.00
$\gamma_{-shape_mcstat_Z_VR_obs_BDTG_bin_0}$	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	十0.00	±0.00		±0.00	±0.00
a_FakesSyst		±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00	±0.00		±0.00	±0.00
γ -shape-mcstat- tZ - V R -obs- BD T G -bin- 0		00.0∏	00.01 + 0.00	±0.00	±0.00	00.0 + 0.00	10.00 	±0.00	#0.00	±0.00	00.0 ₩	00.0 1 1 0 0 0 0 0 0 0 0 0 0 0 0 0
γ -snape-mcstat_tt_CK_obs_BULG_bin_U		00.01 1	± 0.00	00.0±	±0.00	00.0 <u>∓</u>	± 0.00	±0.00	±0.00	±0.00	00.0 1 1	00 1 -
γ -shape-mcstat-W t-V K-obs-BUT G-bin-U		00.0∏	±0.00	±0.00	±0.00	0.0 1 1	± 0.00	±0.00	±0.00		00.0 ₩	0.0 ₩
γ -shape-mestat- <i>Fakes-V R</i> _obs_ <i>BU</i> TU-Din_U	±0.00	00.01	00.01 +	nn.u∓	00.0∏	00.0∓	± 0.00	±0.00	100.0∏	00.0 1 1 0 0 0 1	00.0 ₩	00.0 ₩ +
V all approximates 4 Z C R obs. RDTC him 0						8.04					0.01	8.0
\sim share mestat H V R ohs BDTG him 0		0.00	000+	0000+	00.0+	00.04	0000+	10.00	+0.00	000+	000	0000+
\sim shape mostat $Fakes CR$ obs BDTG bin 0		00.0+	+0.00	+0.00	+0.00	000+	+0.00	+0.00	+0.00	+0.00	0000+	+0.00
γ -shape-mestat- $t\bar{t}$ - V -obs-BDTG-bin-0		+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00
γ -shape-mcstat- DY - CR -obs-BDTG-bin-0		+0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	+0.00	± 0.00	± 0.00	± 0.00	± 0.00
γ -shape-mcstat- WW_VR -obs-BDTG-bin-0		±0.00	± 0.00	± 0.00	± 0.00	± 0.00	± 0.00	±0.00	± 0.00	± 0.00	±0.00	± 0.00
γ -shape-mcstat- $WZ-VR$ -obs-BDTG-bin-0	土0.00	± 0.00	土0.00	土0.00	±0.00	±0.00	±0.00	±0.00	±0.00	± 0.00	±0.00	± 0.00

Table 65: Breakdown of the dominant systematic uncertainties on background estimates in SR_5^{SF} before the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.

Total background expectation5.Total background error ± 1 Total background error ± 1 α -tfGenerator ± 1 γ -shape-mestat tf.SR.obs.BDTG.bin.0 ± 0 γ -shape-mestat.Wt.SR.obs.BDTG.bin.0 ± 0 γ -shape-mestat.DY.SR.obs.BDTG.bin.0 ± 0	50 50 50 54 55 55 55 55 55 55 55 55 55 55 55 55	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$					$ \begin{array}{c c} 0.13 \\ \hline 1.13 \\ \hline 1.$	0.33 ±0.10 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.00 ±0.	$\begin{array}{c c} 0.23 \\ \hline 0.23 \\ \pm 0.27 \\ \pm 0.00 \\ \pm 0.0$	0.10 		$ \begin{array}{c c c c c c c c c c c c c c c c c c c $
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γ -shape_mcstat_tZ_CR_obs_BUTG_bin_0							±0.00	±0.00	±0.00	±0.00	±0.00	±0.00
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Table 66: Breakdown of the dominant systematic uncertainties on background estimates in SR_5^{SF} after the fit. Note that the individual uncertainties can be correlated, and do not necessarily add up quadratically to the total background uncertainty. The percentages show the size of the uncertainty relative to the total expected background.